E READING DEPARTMENT

The Farm

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QUARTERLY, SUMMER 1953, FIFTY CENTS

Farming in Russia

There's no pull like this STRAIGHT pull!

TOUGH JOBS PROVE IT!

SUPER-SURE-GRIPS, made only by Goodyear, have o-p-e-n c-e-n-t-e-r tread with deep, rugged, ruler-straight lugs. They transmit your tractor's pulling power straight to the soil, hold that soil in place with Goodyear's exclusive wedge-in action—boost you through a better day's work than you ever thought possible!

That's Number One reason why farmers overwhelmingly prefer SUPER-SURE-GRIPS. In fact, surveys show that, year after year, these long-wearing Goodyear tires get more votes than the next two makes put together!

SUPER-SURE-GRIPS cost no more—so why shouldn't you have them too? Goodyear, Farm Tire Department, Akron 16, Ohio.

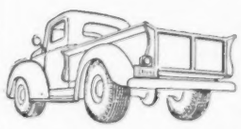
WHY SUPER-SURE-GRIPS GIVE "THE GREATEST PULL ON EARTH"

1. RULER-STRAIGHT LUGS come closer together at shoulders—and so take wedge-like bites that hold soil in place—to give Goodyear tires greater grip.

2. O-P-E-N C-E-N-T-E-R pioneered by Goodyear. Farm experience proves it bites deeper, sharper—pulls better—when combined with straight lugs!

3. LONG EVEN WEAR—because Goodyear straight lugs work against the soil evenly, they wear evenly, roll smoothly on the road, wear longer.

THERE'S A SPECIALLY DESIGNED GOODYEAR TIRE FOR EACH VEHICLE ON THE FARM!



You'll save money, get better service from your truck, family car and farm implements—if you tire them all with Goodyears. That's why more people buy Goodyears, for more uses, than any other tires on earth!

Super-Sure-Grip—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

FIRST in Traction • FIRST in Long Wear • FIRST in Popularity!

GOODYEAR

"America's strength is in the land—Support your Soil Conservation Program"

Super-Sure-Grip Tractor Tires

We think you'll like THE GOODYEAR TELEVISION PLAYHOUSE—every other Sunday—NBC TV Network

Measure your row-crop work. Compare the look-ahead view—instant response steering—effortless, 7-way implement control. Prove to yourself the Super C is unmatched for precise, all-speed, all-crop cultivating.

Measure...Compare...Prove to yourself the McCormick® Farmall® is the Cultivating Champ of its class

Super C

Here is the most practical way to buy a tractor:

Measure the tractor in relation to your particular jobs
Compare it, feature by feature, with any other tractor
Prove to yourself—by actual operation on your own farm—that the Super C is unmatched in the all-purpose 2-row, 2-plow class

Measure all your work. Compare the Super C and your choice of implements for each job, for quality, for top efficiency. Prove to yourself unmatched Super C job range.

Measure operating ease. Compare the hydraulic seat, the double-disc brakes, the handy controls. Prove to yourself you ride in comfort, drive with unmatched ease on a Super C.

Measure pull-power by socking a plow down deep in hard ground. Compare the surge of power. Prove to yourself that pound for pound the Super C has unmatched pull-power.

Measure economy. Compare first cost, upkeep, trade-in. Prove to yourself unmatched economy—15 to 25 percent more work on a gallon of gas on job after job.

Measure years of use. Compare normal service life, performance and durability. Prove to yourself by talking to any user, that Farmalls pay for themselves over and over.

Try a Super C. Measure—compare—prove to yourself the unmatched pull-power and job range. Drive it yourself. Get in-the-seat proof, on your farm. See your IH dealer—prove to yourself that the Super C is Pull-Power Champ of its class.

INTERNATIONAL HARVESTER

International Harvester products pay for themselves in use—McCormick Farm Equipment and Farmall Tractors . . . Motor Trucks . . . Crawler Tractors and Power Units . . . Refrigerators and Freezers—General Office, Chicago 1, Illinois

Send for free Super C catalog—Get all the Facts!

International Harvester Company
P. O. Box 7333, Dept. FQ-6, Chicago 80, Illinois

Gentlemen:
I want the whole story about Super C Pull-Power. Please send me the catalog.

My name is.....

My address.....

My IH dealer is.....

If ever a truck was designed with a farmer in mind...

this new Ford Truck is it! A truck that is "right as rain" for farming!
New, easy handling saves work and time in getting around on the farm.
New "DRIVERIZED" Cab offers a riding treat after hard chores in the fields.
Ford Trucks are new throughout . . . designed to get farm jobs done fast.

Few people know the dollar-value of an hour's time as well as the American farmer does. There are many times when just one hour of his time is worth hundreds of dollars.

Time is money! Today's farmers know it. Ford Truck engineers know it. That's why TIME-SAVING was a major goal in designing the completely new Ford Trucks for 1953. With scores of new TIME-SAVING features, the new Ford Trucks are made-to-order for farm work.

New "DRIVERIZED" Cabs cut driver fatigue. They help save time by making driving easier in many ways:

Better visibility, for instance. Although the new curved one-piece windshield is the most obvious improvement, bigger windows at the sides plus a 4-ft. window at the rear, offer an amazing increase in all-around visibility.

The new Ford Truck seat is something special. Wider, of course. Non-sag seat springs. Adjustable seat cushion *and* separate adjustable back-rest. Most interesting new feature of all is that every seat now has an exclusive *shock snubber* to help level out the ride.

For easier maneuvering in tight quarters, between farm buildings, or in the field, turning diameter has been considerably reduced. This was done by "setting back" the front axle, widening the front tread, and by improving the steering geometry.

NEW "DRIVERIZED" CABS cut driver fatigue. Both Standard and Deluxe Cab (shown) have new curved one-piece windshield, 55% bigger; new wider adjustable seat; new seat *shock snubber;* new push-button door handles.

COMPLETELY NEW Ford Pickup with 6½-ft. box features new *bolted* construction, new clamp-tight tailgate. Choice of V-8 or Six. *Fire* transmissions, including FORDOMATIC DRIVE and OVERDRIVE (extra cost).

Synchro-Silent type transmissions are now standard on all of the new truck models. This means faster shifting and less truck momentum lost. The shift lever on all 3-speed transmissions is mounted on the steering column, where it is easy to reach.

Fully automatic drive is now available in Ford half-ton trucks at extra cost. FORDOMATIC is a great time-saving convenience. More than that, it is a natural for field work because it permits low wheel speeds in rough going, without stalling the engine. A gas-saving, engine-saving OVERDRIVE transmission is also available at extra cost on Ford Series F-100.

Only Ford gives you a choice of V-8 or Six in five different engines. The new 101-h.p. overhead-valve "Cost Clipper Six" is the first and only high-compression, LOW FRICTION-type engine in any light-duty truck. The famous 106-h.p. Ford V-8, proved by billions of service miles, remains the farmers' favorite.

New Ford service accessibility saves time in the shop. Front ends have been redesigned. Hoods are wider. Frames are wider, too, permitting a new fender contour that makes engines much easier to get at.

NEW CLAMP-TIGHT tailgate on 6½-ft. Pick-up features rigid design to prevent sagging under load.

And for '53 you have many more Ford Truck models to choose from in order to get the best truck for your work. A newly added 9-ft. Express, for instance, should develop into a great favorite for farm work.

There's so much more you should know about the new TIME-SAVING Ford Trucks . . . so much more your Ford Dealer wants to tell you. See him soon.

Fifty Years Forward *on the American Road*

FORD *ECONOMY* **TRUCKS**

SAVE TIME! SAVE MONEY! LAST LONGER!

Farm Quarterly, Vol. Eight, No. Two. Editorial, Circulation and Executive Offices, 22 East 12th Street, Cincinnati, Ohio. Published quarterly by the Automobile Digest Publishing Corp.,
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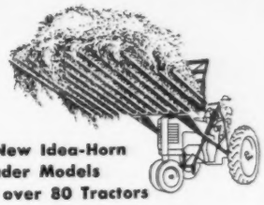
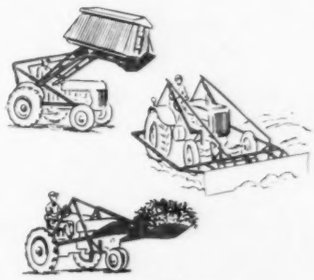
Subscription price 50c a copy; $2.00 for one year; $3.50 for two years; $5.00 for three years. Add $1.00 per year extra for rates outside the U.S., Canada, and Pan-American Union. Entered as second class matter at the Post Office, Cincinnati, Ohio, under the Act of March 3, 1879. (Title Reg. U.S. Pat. Off.)

Handle hay quickly, easily! Do many jobs in less time.



3 New Idea-Horn Loader Models Fit over 80 Tractors



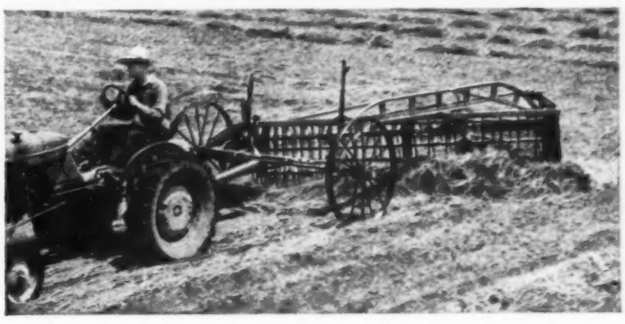
10 easy-on attachments are interchangeable. Fit any of the 3 models, LS, 505 or 50.

Shorten hay-making time, cure hay evenly . . . faster

The faster you can make hay the better. And you'll have better hay when you use a NEW IDEA Rake and Tedder to make fluffy, uniform windrows that dry evenly, quickly, to preserve vitamin-rich leaves.

Double-curved steel teeth pick up even heavily-matted down hay and put it into a large, fluffy windrow. Or move a lever to reverse the reel and you can fluff up damp swaths with the gentlest tedding action. The NEW IDEA Side-Delivery Rake and Tedder, like all NEW IDEA equipment, is a quality tool . . . the result of years of constant improvement by the makers of the first rake of this type. Your community NEW IDEA dealer will show you the many improved features of this rake that mean more protein, more carotene, more nourishment for your stock.

Choose from 2 models . . . the low-wheeled rake shown above with sure-traction tires, or the high-wheeled model with either steel-rimmed or rubber-tired wheels.



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NEW IDEA
FARM EQUIPMENT CO.
Dept. 913, Coldwater, Ohio

DIVISION AVCO DISTRIBUTING CORPORATION

Please send me free folders as checked below:

- ☐ 4-Bar Rakes & Tedders
- ☐ Tractor Mowers
- ☐ Balers
- ☐ All-Purpose Elevators
- ☐ Hydraulic Loaders & Attachments
- ☐ All-Steel Wagons
- ☐ Manure Spreaders
- ☐ Lime Spreaders
- ☐ Stalk Shredders
- ☐ Steel Wagon Boxes
- ☐ Corn Pickers & Snappers
- ☐ Corn Shellers
- ☐ Transplanters

Name_____

Address_____

VISIBILITY
Plus
TUG & PULL

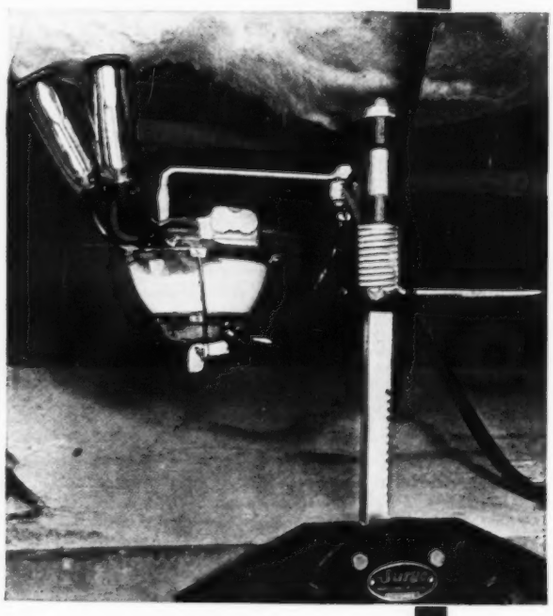
No amount of high priced piping will ever make a good milker out of a bad one! If a milker can't do a good job of putting milk into a bucket, it won't do a good job of putting it into a pipeline.

Surge TUG & PULL that holds the teat cups down where they belong so that they won't creep up and shut off the flow of milk has been paying off for many thousands of farmers for many years.

The Surge Siphon for milking parlors and the Surge Surcingle Breaker Cup for stanchion barns give you Genuine Surge TUG & PULL that has long meant bigger milk checks with greater Safety.

Add to that kind of milking the chance to see how the milk is flowing, the chance to know just when to drop certain teat cups when those quarters are dry and seeing when each cow is milked out . . .

Start right by seeing your Surge Service Dealer . . .



Surge

BABSON BROS. CO.

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SYRACUSE • HOUSTON • SACRAMENTO • KANSAS CITY
TORONTO • ATLANTA • SEATTLE • MINNEAPOLIS

COMING IN FALL

The farmer has been advised not to put all his eggs in one basket. In the Autumn issue the FARM QUARTERLY will explore the practical aspects of diversification as practiced by the dairyman, the grain farmer, the stockman, and a number of other specialists. A crop failure or a drop in the market need not be alarming if the farmer plans ahead.

Cattle feeders have been running hogs in the feedlot since they began feeding cattle. What does it mean in dollars and cents to the cattle feeder? Feeders themselves will give the answers in the Autumn issue, which will also have an article on another aspect of cattle raising, that ever-present menace, shipping fever. There will be a blow-by-blow story on how a part-time farmer learned about starting in sheep and a story on the new "slow" method of raising chickens for the laying flock. The mysteries of breeding under the title, "Genetics for the Farmer" will light up some of the shady places in the farmer's knowledge of what exactly is the difference between inbreeding, outbreeding, crossbreeding, hybrid vigor, and similar complex terms used by the specialists.

A man down in Arkansas grows flowers like a farm crop. He has 200 acres in all kinds of flowers and he'll give the details on his management, methods and profits. There will be a survey of the corn hybrids—how to select a variety for your farm, standards, prices, and the inside workings of the industry. Custom prices of farm work will be charted and a survey made of prevailing prices in various areas.

Important as plowing is, many farmers overlook the mechanics of the operation, which are exacting if the proper depth and width of furrow, the proper hitch, and the best way to lay out a "land" are all combined by the expert operator. "How to plow" will cover all these angles.

The list of features will include a story on the amazing trek which the Basque shepherds make every year to mountain pastures. A personality story on the life and work of the vocational Agricultural teacher will pay tribute to this fine worker among farm youngsters. There will be a roundup of chain saws with detailed instructions on operation and care and illustrations of the more important makes with costs and specifications. A nostalgic piece on apple cider will tell how cider is made, how it is preserved, and the equipment used to make it, both commercially and at home.

The Farm Home section will tickle the memory of those who remember when mother made the bread for the family. This is still possible and profitable, as recipes and methods of our story will show. A story for those who are either building or remodeling will tell of the amazing new heat pumps, which use the thermal heat of the earth in the most economical of all heating and air conditioning systems.

THE FARM QUARTERLY

22 East Twelfth St., Cincinnati 10, Ohio

R. J. McGinnis.....Editor
Fred Knoop.....Executive Editor
Grant Cannon.....Managing Editor
Joann Bell Pierce.....Associate Editor
Chas. R. Koch.....Associate Editor
Noel Martin.....Art Director
Betty K. Green.....Editorial Secretary
Aron M. Mathieu.....Business Manager

May Day on Red Square, Moscow, from the window of the American Embassy

Contents

THE FARM QUARTERLY

Summer 1953, *Volume* 8, *Number* 2

	Page
Stock	
Feeding for an Extra 1000 Pounds of Milk	42
Screw-Worms	46
Hogs from Pigs	58
Fitting and Showing	62
Soil and Cultivation	
Crawler Tractors	30
Tailored Pastures	56
Crops	
Wheat Roots Tell a Story	40
Stack Silos	64
Features	
Farming in Russia	34
Working Buildings	48
All-Weather Lanes	52
The Friendly Meal	60
Chinch Bugs	100
Farm Home	
Pickling Time	72
Dishwashers	74
Kissin' Bridges	78
Departments	
Letters	10
The Dairy Barn	16
Poultry Yard	14
The Farm's Pictures	18
Farm Books	22

B.F. Goodrich

POWER-CURVE CLEATS DIG DEEPER BECAUSE THEY'RE HIGHER IN THE CENTER THAN THOSE OF OTHER LEADING MAKES
POWER-CURVE CLEATS ARE EVENLY SPACED FROM CENTER TO SHOULDER TO FORM OPEN CHANNELS. DIRT DROPS OUT EASILY
THE ARROWHEAD NOSE OF EACH CLEAT DIGS INTO EVEN THE TOUGHEST SOIL, WILL NOT ROLL BACK
POWER-CURVE TIRES ARE SHAPED LIKE A ROUND-POINTED SHOVEL TO PENETRATE BETTER, GIVE MAXIMUM TRACTION

No other tractor tire has this shape and tread!
No other tractor tire gives so much traction!

POWERFUL! Different! That's the B.F. Goodrich Power-Curve tractor tire, with its rounded profile and curved, arrowhead cleats.

As a round-pointed shovel digs into the soil easily, so the rounded profile of a Power-Curve tire penetrates better. Result: full shoulder-to-shoulder traction in reverse or forward.

The arrowhead nose of each Power-Curve cleat takes a sharp, clean bite into the soil, assures you of maximum drawbar-pull. And these husky cleats are built higher in the center than those of other leading makes because the special curve reinforces them. Tapered Power-Curve cleats dig deeper, give greater pulling power.

The open-center tread cleans naturally as the tire rolls. Every turn of a Power-Curve tire counts. You work faster in the field, save fuel.

See this tire that is treaded and shaped for top traction at the store of your B.F. Goodrich retailer. You'll find his address under Tires in the Yellow Pages of your telephone book. *The B.F. Goodrich Company, Akron, Ohio.*

TUNE IN
the Burns & Allen Show, CBS—TV

RESEARCH KEEPS
B.F.Goodrich
FIRST IN RUBBER

Sitting Pretty

ON A 2 BILLION DOLLAR NEST OF GOLD!

No wonder she's sitting pretty. Two billion dollars! That's what Americans paid for eggs last year. A lot of money? You bet! A lot of eggs too! One of the chief reasons for this staggering production figure is improved feeding methods. Scientific tests have been made, and they prove that when Seagram Solubles are used to boost the nutritional value of ordinary feeds results are more eggs, bigger eggs and greater profits. The reason for this greater efficiency is because Seagram Solubles supply the important proteins, minerals, B-vitamins and other growth factors.

The supply of this nutritional feed supplement is kept as high as our production permits and is distributed to feed dealers to enrich the feeds they sell.

JOSEPH E. SEAGRAM & SONS, INC., LOUISVILLE 1, KENTUCKY

Seagram

SERVICE TO AGRICULTURE

Sign of better health for your livestock

Hundreds of new signs like this are going up across the country

A new sign . . . a new graduate veterinarian begins his professional practice.

It's a great day for him . . . and for you, too, because he's a specialist you can rely on to help protect the health of your livestock—and your investment.

If there is a new veterinarian in your community—bid him welcome. He's one of hundreds* of new graduates who are joining 15,136 older veterinarians in playing a vital role in America's livestock industry.

Young or old—your veterinarian is a man of high professional standards . . . a man who subscribes to this creed . . .

"To regard my profession as something more than a means of livelihood . . . To guide my conduct by sober judgment . . . To be modest, and open-minded and thankful for every opportunity to increase my knowledge and my usefulness . . ."

Backed by vast veterinary research . . . by years of intensive scientific study . . . your veterinarian brings to your farm high professional skill for diagnosis, specialized treatment, surgery, and counsel on preventive practices including nutrition.

Vital allies of your veterinarian in conquering disease are effective, reliable drugs. Squibb serves the veterinary profession and you by providing drugs of highest efficacy . . . veterinary products based on sound, authoritative research.

Your veterinarian, plus dependable drugs, and good management practices—*all working together*—help keep your herds healthy, productive, and more profitable.

CONSTANT RESEARCH —Squibb scientists are constantly seeking and discovering new and better drugs . . . to aid your veterinarian in bringing better health to your livestock.

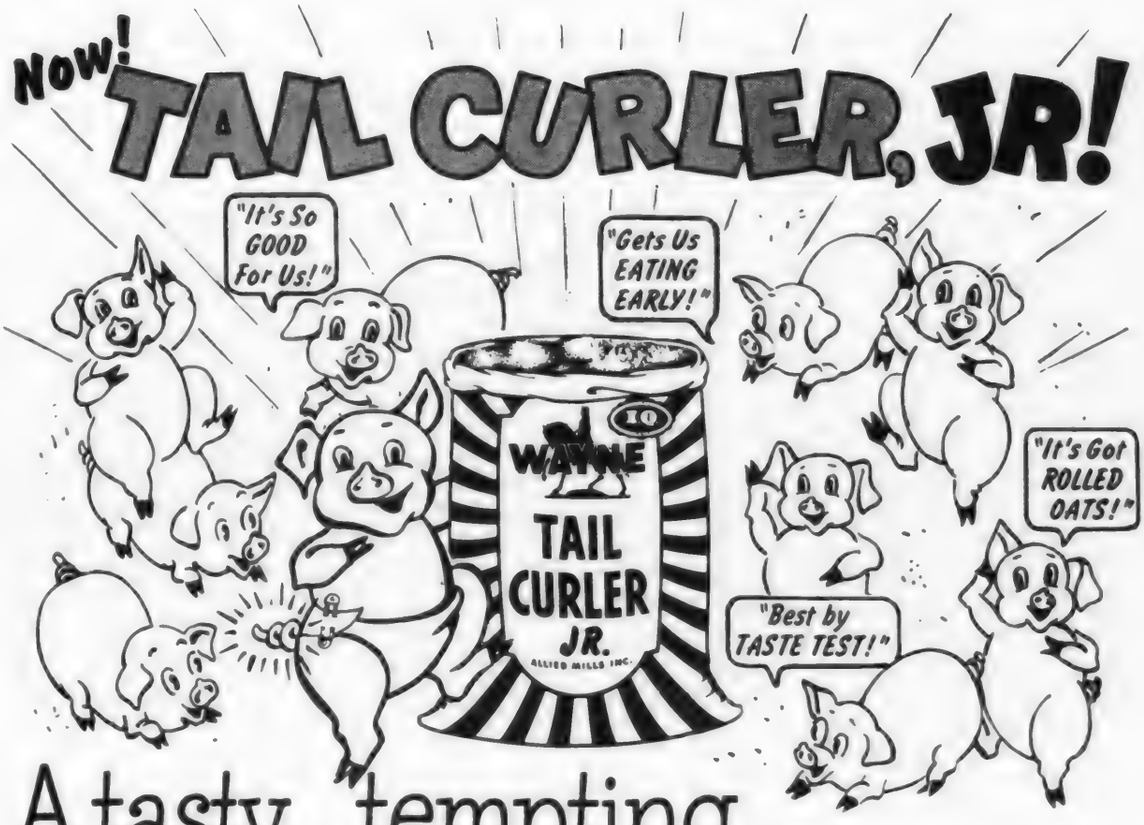
E. R. SQUIBB & SONS
Division of Mathieson Chemical Corporation
745 Fifth Avenue, New York 22, N. Y.

For prompt, accurate diagnosis, always consult your veterinarian.

*More than half of the estimated 865 new graduates will enter general practice. Others will begin important work in specialized practice, armed forces, teaching, research, regulatory or commercial services.

SQUIBB —A NAME YOU CAN TRUST

NOW! TAIL CURLER, JR!



A tasty...tempting...

NEW CREEP-FEED FOR BABY PIGS

Now . . . a feed to help you

- **. . . get baby pigs on solid feed early — before sow's milk dwindles.**
- **. . . speed 'em to husky weaning weights — up to 40 lbs. or more.**

Created by Allied Mills scientists—after countless "taste" and "growth" tests at one of the world's largest swine research centers . . . extra tasty, extra tempting Wayne Tail Curler, "JR" is an adaptation of the original, famous Wayne Tail Curler (now called "SR"), which has produced such phenomenal results for thousands of hog raisers.

Proved on hundreds of baby pigs, Wayne Tail Curler, JR. is just right for their delicate digestive and body needs. Plenty of rolled oats, of course, but more than that! A blend of specially-developed palatability factors . plus power-packed Wayne ingredients supplying essential Amino Acids. Energy, Calcium; Phosphorous, Trace Minerals; Antibiotics... more than a dozen special vitamins and potent "pig growth" factors.

Consistently preferred over other leading pig starters tested Tail Curler, JR. was eaten far more readily in extensive free-choice feeding tests with suckling pigs.

In special baby pig size pellets, Tail Curler, JR. is ideal for creep-feeding... tempts pigs into early eating as soon as they start sniffing around the feeders.

Every bite is a balanced ration. It works well with synthetic sow's milk or milk substitute programs.

Every hog man knows a BIG pig at weaning time means a *fast and efficient gainer* all the way to market. Get set NOW for big pigs—fast gains. Feed Wayne Tail Curler, JR., to weaning—starting at one week. Feed Wayne Tail Curler, SR., from weaning to 75 lbs. Then switch to regular Wayne growing and fattening program—get to early markets.

START IN TIME!
GET YOUR SUPPLY TODAY
from
your friendly Wayne Feed Dealer.

WAYNE FEEDS

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ALLIED MILLS, INC., Builders of TOMORROW'S Feeds . . . TODAY!
Executive Offices: Chicago 4, Ill. **Service Offices: Fort Wayne 1, Indiana**

HERE'S HOW TO PUT

new life

IN TIRED ENGINES!

If you want to get your tractor in tip-top condition . . . cut oil consumption, restore power, and make your engine purr . . . install Perfect Circle's 2-in-1 Chrome Piston Ring Set on your next re-ring job!

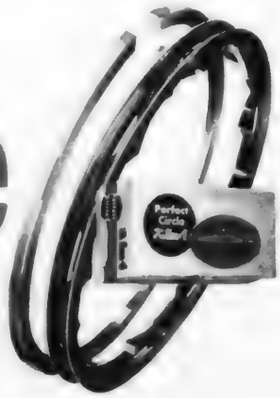
For 2-in-1 is the truly modern set that seals compression, seals oil for over twice as long as ordinary ring sets! Solid chrome plating on both the oil and top compression rings eliminates tedious break-in periods and assures sustained power and oil economy for thousands of extra miles. And 2-in-1 is the only set that offers a choice of spring pressures to meet every condition of cylinder wear.

For new engine life, for double the time between re-ring jobs, install Perfect Circle's 2-in-1 Chrome Piston Ring Set in your car, truck or tractor now! Perfect Circle Corporation, Hagerstown, Indiana; The Perfect Circle Co., Ltd., Toronto, Ontario.

Perfect Circle

2 in 1 chrome piston ring set

The Standard of Comparison



LETTERS

Farming Under the Red Star

Sirs:

I just recently came to read your article 'ZADRUGA" about your visit in Jugoslavia, published in the Autumn edition 1949 of *"The Farm"* and grant myself the privilege to give some comments to it.

You show photographic pictures of habits of life, of living quarters of the new colonists, of farms and cattle. I see that you personally have taken the pictures and seen this all.

On the first page (page 23) of your report to my surprise in the lower right hand corner I found my farmhouse of my large farm-estate in Mali-Idjosch. Explanation reads as follows:

> "This former home of a rich peasant farmer is now headquarters for a livestock unit of a collective farm. The Red Star is a late addition."

THIS HOUSE is now collectivized.

I include a similar photographic picture of my house taken before the war. In the doorway stands my old father, who was starved to death in Tito's camps. A picture on the next page showing a man with a Simmenthal bull is explained with:

> "The Germans overlooked this Simmenthal bull."

Here I recognized my own purebred Simmenthal bull that I bought for much money and had imported from Switzerland. The picture is taken in front of my blacksmith shop and mill on my farm. A third picture on page 31 shows some of my best Simmenthal cows I had owned.

Your report tells that the German colonists, whose ancestors settled there centuries ago, were loaded with small baggage into trucks and dumped over the frontier into their native land. Such fairytales could have been told to you, but reality was different. People of German descent who could not flee in time from the advancing Russian army were driven into camps by the Jugoslav partisans. There they were left to die slowly of either typhoid or starvation. Very few survived those hunger-treatments and up until today do forced labor for other nationals. They are not allowed to return to their own communities where they were born and from where they were displaced.

Fortunately, I personally was able to get away with some of my fellow countrymen in time and immigrated to the U. S. A. three and one-half years ago. My parents, wife, sister and mother-in-law, who had joined our flight, but decided to return to my farm, perished in the camps of Jugoslavia.

Through remarriage and financial support of my wife here in U.S.A., I again became a farmer but not under the dreaded Red Star but under the flag of the Stars and Stripes.

Romulus, Michigan

Christian Welker

Goose Turned Ham

Sirs:

I thought you would be interested in what

SEEING IS BELIEVING!

Get a SHOWDOWN DEMONSTRATION of the Far More Powerful FERGUSON "30"

There's a compelling truthfulness and frankness about a Ferguson Showdown Demonstration right on your own farm.

You can't help but realize that the Ferguson Dealer is trying to help you make an important decision . . . a decision that can affect the costs and over-all efficiency of your farming operation for the next several years.

For this reason, your Ferguson Dealer does more than prove that the Ferguson is just about the world's best plowing tractor . . . that the Ferguson System offers you advantages no other tractor can duplicate . . . or that a Ferguson gives you the flexibility and versatility so necessary in today's diversified farming. His demonstration goes far, far beyond these well-known reasons for buying a Ferguson.

He impresses you with facts about Ferguson's outstanding safety features . . . about the features that make for remarkable economy over the life of the tractor. He tells you about the convenience features of a Ferguson . . . all of them helping to save you time and effort every day you use this tractor.

All in all, there is a great deal of worth-while information to be had at a Ferguson Showdown Demonstration. You'll find this valuable whether or not you buy a Ferguson Tractor immediately. Why not call your Ferguson Dealer soon and discuss it?

GET THIS NEW BOOK. Just ask your Ferguson Dealer for free copy of "How to buy a Tractor". It's worth reading. Or write to Harry Ferguson, Inc., Detroit 32, Michigan.

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BIGGER... in Power... Performance... Economy

For dependable hydraulic power, make sure your tractors have..

VICKERS HYDRAULIC PUMPS

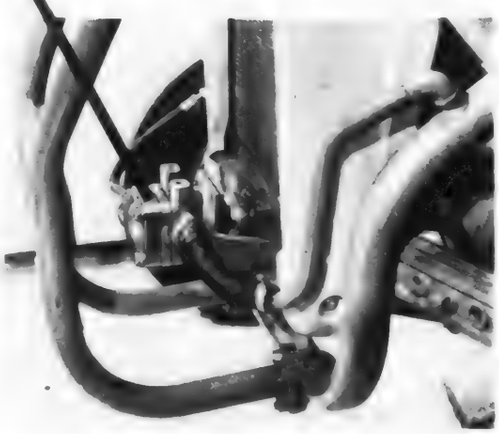
Vickers Pump with hand adjustment to vary rate of oil flow as desired at normal engine speed. Pump is engine driven and hydraulic power is available with clutch disengaged.

Here you see how one of the leading manufacturers of farm tractors uses Vickers Pumps to provide dependable hydraulic power for implement control. These Vickers Pumps are vane type, hydraulically balanced and have automatic wear compensation. This means that they deliver more oil while taking less power from the engine . . . that they have a much longer life with minimum maintenance . . . and that they provide easier cold weather starting of the tractor.

The next time you buy a tractor, look for the Vickers Pump on the hydraulic system . . . it is the mark of a tractor that will do more and better work with less effort.

People who look to quality look to

VICKERS



Power for heavy-duty loader is supplied by this separate Vickers Pump mounted on front end drive (radiator grille removed.)

VICKERS Incorporated

DIVISION OF THE SPERRY CORPORATION

1534 OAKMAN BLVD. • DETROIT 32, MICH.

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

6322

Application Engineering Offices: ATLANTA • CHICAGO (Metropolitan) • CINCINNATI • CLEVELAND DETROIT • HOUSTON • LOS ANGELES (Metropolitan) • NEW YORK (Metropolitan) • PHILADELPHIA PITTSBURGH • ROCHESTER • ROCKFORD • SEATTLE • TULSA • WASHINGTON • WORCESTER

happens to a goose when he becomes a celebrity.

Last summer you showed a picture of a goose who up to that time had been spending a happy life with his main objective being the clearing of crab grass out of strawberries.

His color picture appeared on Page 50 of the Fall, 1952 issue of FARM QUARTERLY in the article, "The Goose Makes A Comeback." He now considers himself above all common geese and prefers the company of humans. When anyone comes out of the farm house, he leaves the flock and comes up to be patted. He also likes to jump on the farmer's son's lap and will climb up on his shoulders.

THIS SHOWOFF goes into his act at the click of a shutter. He feels Donald Duck is vulgar, his ambition is to do a bit in Swan Lake.

The photograph above shows him in his shoulder balancing act. He is quite jealous, too, and if any other members of the flock approach too close, he'll take after them and chase them away.

Jim Hogan

Lafayette, Ind.

Urea Costs Less

Sirs:

We found your article on "Feed Facts" in the spring issue of "THE FARM QUARTERLY" both interesting and informative. However, I believe we have detected a typographical error in that article in the second column of Page 59. You speak of a urea-corn mixture as costing about 34c when, actually, your figures indicate that this cost should be 24c. Indeed this lower price would be necessary to support the 6c saving you speak of further along in the paragraph.

F. G. Keenes, Manager
Nitrogen Produce Sales
E. I. DuPont de Nemours & Co.

Wilmington, Delaware

The cost of the urea-corn mixture should have been 24c. The proof-reader who allowed a 3 to replace a 2 has been advised to purchase new glasses.

Back Issues

Sirs:

We have just started our subscription to THE FARM QUARTERLY and would be very glad to get any of the back issues which you might have.

A. F. Ellerman

Collins, Missouri

Our supply of back issues is limited to the last few numbers. Do any readers have back issues they want to part with?

ANOTHER TRAINLOAD OF PHOSPHATE ROCK
on its way to the farms of America . . .
Each year thousands of carloads of finely-ground AA QUALITY PHOSPHATE ROCK, in bags and bulk, move from the Florida Mining Headquarters of The American Agricultural Chemical Co., one of the world's largest producers of this basic plant food.

WHY NOT start now to use PHOSPHATE ROCK on YOUR FARM?

A liberal application of finely-ground Phosphate Rock is the most economical and profitable way to assure a continuing supply of the vital plant food, Phosphorus, key to healthy growth and good crop yields. Thousands of farmers find that AA QUALITY PHOSPHATE ROCK pays for itself the first year, and keeps on paying profits for from 5 to 8 years on the original investment—returns up to $8. for each dollar invested.

Today's conditions call for low-cost crop production, and the best way to reduce costs is to increase per-acre yields. Principal obstacle is phosphorus deficiency, a fact recognized by agricultural authorities and confirmed by soil analyses on thousands of farms each year by our own A.A.C. Soil Service.

This growing phosphorus deficiency is explained by the fact that the usual applications of mixed fertilizers and superphosphate do not replace the phosphorus moving off the farm in crops, milk and meat, not to mention loss due to other causes.

The Economical, Profitable Answer

That is why it will pay you well not only to maintain but also to build up the phosphorus in your soil by making liberal applications of finely-ground Phosphate Rock. Don't consider rock as a substitute for, but as an addition to, your regular fertilizer program. This is the low-cost way to assure a supply of vitally needed phosphorus for the crops to draw on throughout the rotation.

The American Agricultural Chemical Co., one of the world's largest producers of phosphate rock, mixed fertilizers and superphosphate, offers high-quality, finely-ground Phosphate Rock, at most economical prices.

Where to Start this Fall

If you are not as familiar with the profitable returns from rock as Illinois and Missouri farmers, for example—who use nearly a million tons of rock each year (*in addition* to a six-fold increase in the use of mixed fertilizers and superphosphate in the past ten years)—why not start using Phosphate Rock on your farm this Fall, on any of the following:

- Fall Alfalfa Seedings;
- New Clover-Grass Permanent Pasture Seedings;
- Legume Seedings for grazing or plowing under (Caley Peas, Vetch, Crimson Clover, etc.);
- Fall-sown small grains to be seeded to Legumes (Red Clover, Sweet Clover, Alfalfa, Lespedeza, etc.);
- Topdressing Established Clover Seedings and Alfalfa;
- On Cornstalk Land to be seeded next Spring to Small Grains and Legumes;
- On fields to be manured.

One application pays dividends year after year for 5 to 8 years. AA QUALITY PHOSPHATE ROCK is thoroughly washed, dried and finely ground before shipment, can be safely applied any time you can get on the land. It comes direct from our mines to your farm —utmost economy, a REAL VALUE.

Write for Booklet

See your nearby Agrico or AA Quality Fertilizer Agent now for your requirements, bagged or bulk. Write for illustrated booklet giving helpful information.

AA QUALITY PHOSPHATE ROCK is produced by the makers of AGRICO®, The Nation's Leading Fertilizer—AA QUALITY® Fertilizers —and 18% NORMAL© Superphosphate . . .

The AMERICAN AGRICULTURAL CHEMICAL Co.

Alexandria, Va.	Henderson, N. C.
Baltimore 24	Houlton, Maine
Buffalo 6	Laurel, Miss.
Carteret, N. J.	Montgomery 2
Charleston, S. C.	Norfolk 6, Va.
Cincinnati 17	No. Weymouth, Mass.
Cleveland 11	Pensacola, Fla.
Clinton, Iowa	Pierce, Fla.
Columbia, S. C.	Savannah, Ga.
Detroit 31	Spartanburg, S. C.
East St. Louis, Ill.	Phoenix, N. Y.
Greensboro, N. C.	

These Farmers KNOW It Pays

ILLINOIS: "Applying Rock every 6 years has increased corn yields by 65 bu. per acre—doubled oat yields."
—J. Spangler, Franklin Grove.

OHIO: "Broadcasting Phosphate Rock saved my alfalfa seeding, turning loss into profit... there is no better plant-food value." **—R. Kiplinger, Massilon.**

MICHIGAN: "Using Rock before clover, followed with wheat fertilizer, gave me 50 bu. wheat per acre, 10 bu. **above** average. $20.30 EXTRA profit at cost of $9.10 for Rock."
—K. Witt, Cassovia.

TEXAS: "AA QUALITY Phosphate Rock increases yields of legumes and grasses on our hay and pasture lands . . . provides better feed for our prize cattle."
—J. D. Hudgins Estate, Hungerford.

INDIANA: "In dry season, 1000 lbs. of Rock on clover followed by Agrico on corn gave me an 80-bu. crop—20 bu. **above** average, $24 MORE corn for only $9.38 for Rock!"
—H. Bell, Bourbon.

PENNSYLVANIA: "On 8-acres of alfalfa land, rock paid us a NET profit of $332 . . . earned us $52.50 MORE per acre than neighbors averaged."
—Smucker Bros., Bird-in-Hand.

VIRGINIA: "Using rock on my soybeans, I made 30.44 bu. per acre, as against 22.89 bu. **without** rock. My EXTRA gross return per acre was $20.38."
—W. P. Grimstead, Norfolk.

FLORIDA: "Our calf crop averaged 118 lbs. MORE per head after grazing on pasture fertilized with AA QUALITY Phosphate Rock."
—P. E. Williams, Davenport.

ALABAMA: "Where rock was used, our yield on Caley Peas was 21,440 lbs. per acre, as against 4320 lbs. per acre where rock was not applied." **—Webb Bros., Marion.**

MISSOURI: "AA QUALITY Phosphate Rock cost me $9.50 per acre to apply, but paid me a return of $133.75 per acre in hay and seed." **—H. Gibson, Hamilton.**

KENTUCKY: "Phosphate Rock grew us 5 EXTRA bu. of orchard grass seed per acre... and this 12-acre pasture carried 25 head of Angus beef cattle for 2 months —no other feed!" **—E. Bonar, Crittenden.**

AA QUALITY PHOSPHATE ROCK

FINELY-GROUND FLORIDA PEBBLE PHOSPHATE ROCK

Prove to yourself how STONEMO GRIT *reduces feeding costs!*

MAKE THIS SIMPLE TEST

Divide your flock. Take ½ of them —give them your regular care and feed — without using STONEMO Granite Grit.

Take the other ½ — but include STONEMO Granite Grit in the feeding program, according to directions, right from the start.

Then compare! See what a difference STONEMO Granite Grit makes in increased weight through better use of feed—and in less cost of feed per pound of meat or per dozen eggs.

Read what these poultrymen say about extra profits

HERMAN DEMME
Dembro Poultry Farm, Sewell, New Jersey
"We have found the extra grinding surfaces of Stonemo help grind out more of the valuable nutrients from every bag of feed, and we always recommend Stonemo as a real feed saver to all our customers."

L. H. CHESSHER
Chesshar Hatchery, Nixon, Texas
"I am convinced its (Stonemo's) sharp-cutting extra grinding surfaces get more nourishment out of every pound of feed, and *help reduce feed cost.*"

ROLAND W. BEAUCHAMP
Roland W. Beauchamp & Co., Bishop, Md.
"For many years your Stonemo Granite Grit has been on our payroll. Those extra grinding surfaces have done a great job for us in keeping feeding costs down."

Whenever you order feed, be sure to order hard, insoluble STONEMO to grind out more of its nutritional value. Good feed and good grit are your "partners for profits!" Get STONEMO Granite Grit in convenient 80-lb. bags, and send for free descriptive folders.

STONE MOUNTAIN GRIT COMPANY, INC. DEPT. FQ-S
Executive Offices and Quarry: LITHONIA, GEORGIA
Branch Quarry: BARRE, VERMONT

STONEMO

The Grit with the EXTRA GRINDING SURFACES

Poultry Yard

Heat, Humidty and Eggs Don't warm an egg unless you plan to cook it—for a warm egg will perish in short order. At just under 100 degrees Fahrenheit, fresh eggs become distinctly unfresh in three days or less: at 77 degrees they may hold up for as long as eight days: at 45 degrees they are still in good condition at the end of 65 days; and they will keep in top quality for 100 days if held at 37 degrees. During the summer, another important factor in keeping eggs is humidity. If the humidity and the temperature rise, you have ideal egg-spoiling conditions. A few hours of this and the eggs will go down in grade.

High Water In the Coop Broiler raiser Robert Harris, of Clermont County, Ohio, has developed a method for adjusting his automatic watering fountains so that he can raise them above the floor level as his chickens grow bigger and as the deep litter grows deeper. With fountains at proper level, the chickens scratch less litter into them and less water is spilled. The main water pipe is kept level throughout the house by setting the nail on which it rests on the same graduation mark on each post as shown above. The nail holes are an inch apart.

The Pure Chickens Since 1948 the Laboratories of Bacteriology of the University of Notre Dame (called LOBUND) have been trying to find out what would happen to animals raised in a germ-free world. Among the animals subjected to this pure life are a group of chickens. The chicks begin their germ-free life in the egg when the shell is sterilized with a germicide and then set to hatch in an absolutely sterile environment. The chicks in their new home—a large steel cylinder—sterile, of course—are so free from germs they have no odor.

These chickens are proving helpful in our efforts to determine why antibiotics step up the rate of growth. The germ-free chickens do not increase their rates of growth when fed antibiotics which leads

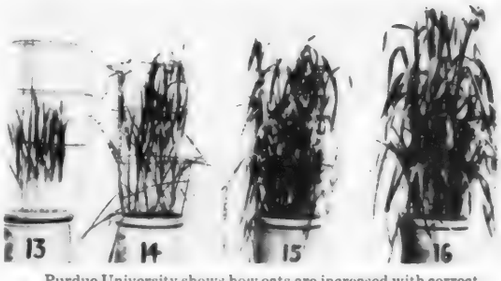
(*Continued on page* 18)

Here's HOW to DOUBLE THE YIELD OF EVERY ACRE

227 Bu. Corn • 100 Bu. Wheat • 125 Bu. Oats
30 Tons Tomatoes • 5 Tons Hay • 906 Bu. Potatoes
Increase Milk Production as Much as 300%

It's not too late to do something about this year's yield, to get bigger and better crops. You can take your **Sudbury Soil Test Kit** right out in the field—use it where crops are growing, and know right away what each field needs to produce a bumper yield. It tells you just what to do. In fact, adding some fertilizer after crops are growing is often far more effective than putting it all on at planting time.

You can turn poor fields into money-makers—and make good fields surpass all previous records. You'll get back up to $15 in extra yield for every dollar spent on fertilizer. Beat falling prices by making every acre do more.



Purdue University shows how oats are increased with correct fertilizers. Soil in pot 13 was low in nitrogen; pot 14 low in phosphate; pot 15 lacked potash. Pot 16 with the right amounts of all three produced vigorous, healthy growth.

Make More Money This Year

One wrong guess will cost you more than a dozen Soil Test Kits! Using this Kit can mean the difference between profit or loss. It does more than just help produce record yields this year—it actually builds up your soil for years to come instead of draining its vitality. It will pay for itself many times over this very season and will become your lifetime guide to better farming. You can turn poor soil into good soil—and make good soil even better!

Your prosperity depends on the soil. You not only make more money, you save money—every season your **Sudbury Soil Test Kit** will save you up to $15 an acre on fertilizer. Guessing wastes both time and money, like the farmer in Illinois who "guessed" he needed 235 tons of limestone, but tests showed he didn't and saved him $500 which paid for the phosphate really needed on 65 acres.

Lack of the right fertilizer cuts your profit on all crops, just like ears of corn at left. The stunted, deformed ears were grown in poor soil—(2) lacked nitrogen; (3) needed phosphate and (4) was potash starved. Ear (1) was grown in balanced soil.

No Knowledge of Chemistry Needed

EASY AS READING A THERMOMETER

So simple anyone can use it. Even your first tests will be accurate and reliable. There's no waiting for reports—the correct answer is printed right on the chart. Ready to use anytime, anywhere. Takes only 10 minutes, costs less than 10c a test. You'll learn more about your soil than from a lifetime of farming! Ag Colleges, County Agents, Vo-Ag Teachers and Experiment Stations, as well as progressive farmers everywhere depend on it.

Farmers deLuxe Soil Test Kit

Complete with everything you need for hundreds of tests. More valuable to you than all your stock and tools! Shows the right amounts of nitrogen, phosphate and potash for each field. Also shows whether lime is needed (pH) and how much. Lifetime welded steel chest with carrying handle, weighs only 12½ lbs. Easy instructions and charts show needs of 225 different crops. Order today, big value, low cost **—only $29.95!**

Also sold on Easy Payments if desired—see bottom of coupon.

You Take No Risk **Our Daring Guarantee**—We are so certain you'll get bigger yield and better quality with your Kit, we'll refund the full purchase price anytime this year, if you don't.

SEND NO MONEY

Order today, C.O.D. **only $29.95** plus postage. Or send check and we'll pay postage, saving you from $1.26 to $2.93 in postal charges.

FREE BOOK In addition to saving postal charges, we also include the valuable 64-page book, "Our Land and Its Care" FREE.

BETTER CROPS Guarantee

Order Right Away!

SUDBURY LABORATORY, Box 799, South Sudbury, Mass.

Send me the Farmers deLuxe Sudbury Soil Test Kit at the special low price marked below:

☐ Enclosed is $29.95; send postpaid; include free book, "Our Land and Its Care."

☐ Send C.O.D. only $29.95 plus postage.

Name .....

R.D. or St. .....

P.O. ..... *Zone* ..... *State* .....

☐ Send on Easy-Payment Plan—I'll pay mailman $4.95 plus postage, then 4 monthly payments of $6.75 each.

Hardware, Seed, Grain and Farm Supply Stores: Serve Your Customers by Carrying This Essential Aid to Better Farming. *Write for Special Offer.*

SUDBURY Soil Test Kits

SUDBURY LABORATORY, Box 799, South Sudbury, Mass.

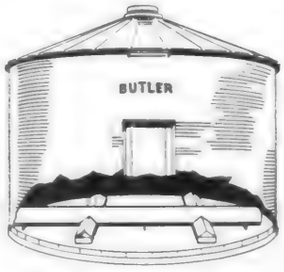
World's Largest Makers—Over 400,000 Now In Use

Store and condition 1,000 to 17,600 bushels of grain with only one system. You can use the Butler aeration system in single or multiple Butler grain bin installations.

HERE'S HOW

new **BUTLER**

aeration system conditions your grain



Butler aeration system moves a steady, accurately-controlled volume of air through scientifically designed ducts. It aerates *all* your grain, lowers its temperature for safe storage in a matter of hours!

The new Butler aeration system gives you a complete grain conditioning unit with ducts, fan and motor assembly for 1,000 and 2,200-bushel Butler steel grain bins. It promotes the *natural* conditioning of your stored grain by circulating a controlled volume of air through it for quick cooling.

This prevents heating, protects you against losses due to spoilage and insect activity. You can upgrade grain with 18 to 20% moisture content for higher market prices, better feed, safer seed! And you can do it at a cost of only a few cents a bushel.

Consider all the advantages of Butler aeration, add the benefits of weather-tight, bird and rodent proof storage Butler steel bins give you. You'll see why it will pay you to store and condition your 1953 crops in Butler grain bins with the new Butler aeration system!

Send coupon NOW for free Butler folders by mail!

Learn how Butler grain bins and Butler aeration can solve your grain storage problems . . . give you new profits this year and in the years ahead! Mail coupon today.

For prompt reply, address office nearest you

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BUTLER STEEL PRODUCTS

OIL EQUIPMENT — STEEL BUILDINGS
FARM EQUIPMENT — CLEANERS EQUIPMENT
SPECIAL PRODUCTS

The Dairy Barn

Less Skidding More Power When a wheel tractor gets down and crawls, it develops a lot more push even on wet slippery concrete. And that's just what is needed when heavy piles of manure are moved with a scraper. The device that makes it possible to convert a wheel tractor into a crawler is manufactured by the Arps Corporation of New Holstein, Wisconsin. The one shown below is being used on the Harvey Born Farm at South Amhurst, Ohio.

CRAWLER TREADS convert wheels to tracks.

Rotational Grazing and The Barometer Cow Ken Kreuger, of Polk County, Wisconsin, is using a cow as a pasture tester for his whole herd. Kreuger is following a short rotational pasture system and, like other dairymen, has run into the problem of when to shift from one pasture plot to the next. Last summer, Kreuger began using the system which involves frequent mowing, heavy fertilization, and similar intensive practices. Without any changes in his herd or other changes in his feeding, he shipped more milk in 1952 than in any other summer.

He used a total of 13 acres of pasture which were broken down by single-wire electric fence into six paddocks; each paddock was crossfenced into three sections, making a total of 18 sections in all. His 18-cow milking herd was put on a section and left on the fresh young pasture from three to five days at which point a cross fence was removed giving them access to another third of the paddock. When these animals were through with all three sections of a paddock and moved on to the next, 23 head of young stock were turned in to clean up the old one. When all six paddocks had been used, the herd returned to the first one—now fresh again and rested—and began another round.

Kreuger didn't have to guess when it came time to change to a fresh plot. He left the decision up to an old but high producing cow who showed unusual sensitivity to worn out pasture. This barometer cow dropped off two pounds each milking the day after a pasture passed its best point. The second day after the pasture started down hill, the barometer cow

would drop off five more pounds in yield.

The pasture used was a seven-year-old stand of alfalfa-brome-ladino. Each paddock was mowed once during the summer to insure even, young growth. No drag was used on the plots, but the mower both topped the herbage and broke up the droppings somewhat. The rest periods allowed sufficient comeback to keep the 41 head of milking and dry cattle at their best until September 15th when the effects of a very dry August caused Kreuger to take them off pasture to protect the paddocks for this year's use.

This year, Kreuger has added 11 more acres to the intensive pasture and divided the whole 24 acre plot into 12 equal paddocks or 36 sections. He is expanding his herd to 24 milking cows to take advantage of the extra pasture. One other change is that he is putting more emphasis on ladino. He has found that alfalfa peters out under intensive rotational grazing while ladino bounces right back into production and brome grass goes on indefinitely.

Timer for Milkers Louis Vander Plate, a New Jersey farmer turned inventor, has produced a gadget which he believes will help prevent mastitis in our dairy herds. Working on the theory that at least some of our mastitis problem stems from overmilking with machines, Vander Plate has devised an automatic timer which can be pre-set to stop the milker after a given number of minutes. When the time is up, the timer shuts off the vacuum. The teat cups, on a DeLaval, are automatically taken from the udder and placed back on the milker —with a Surge, they fall back to the side of the pail. Vander Plate believes that the timer will eliminate stripping and make it possible for one man safely to handle five cows.

Summer Heat vs. Production The USDA is continuing its Columbia, Missouri, study of temperature and humidity effects on milk yields of dairy cattle. Cows, like humans, they find, taper off on eating during hot weather, which is nature's way of keeping the body heat from going too high. A sort of biological thermostat kicks on at the proper moment to limit food intake. This, they believe, may be the reason why milk production in the heat of summer is often below winter levels, in spite of good pasture.

In most dairy breeds, sweating ability reaches a maximum, and appetites as well as production drop, as the thermometer rises above 80 degrees. Brahman cattle are not particularly affected up to 95 degrees—not because they are able to sweat more and so cool off, but because of their greater body surface. Their larger ears, dewlaps, and humps add up to 12 per cent more body area for the same animal, allowing them to get rid of more heat.

More usable space with straight sidewalls!
Notice how the big self-propelled combine wheels right up to the wall.

"If you need a good building I recommend BUTLER"

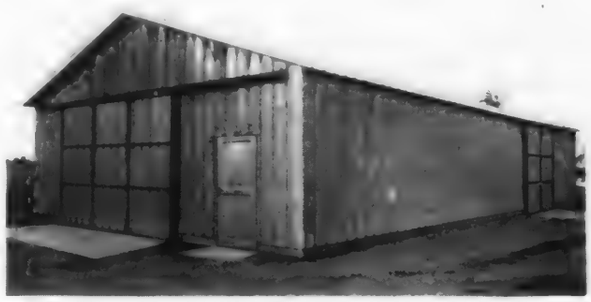
. . . Carl Peterson, Inman, Kan.

"After my old machine shed was destroyed by fire, I started looking at metal buildings," says Mr. Peterson. "After checking on a number of types I definitely settled on a Butler rigid frame building. It is 32 feet wide, 60 feet long with 10-foot straight sidewalls. This gives me space for a shop, 3,000 bushels of grain and all my machinery. A number of my neighbors have inspected this building and all have commented favorably on the construction. *I am more than satisfied and recommend a Butler to anyone needing a good building.*"

GET THE BUTLER STORY BEFORE YOU BUILD!

. . . then you'll know the exact cost before you start! SEND COUPON NOW for facts about Butler machinery storage, grain storage, loafing or feeding barns, hog houses, milking parlor, laying houses or *combination buildings* that help you save time by putting more chores under one roof.

WRITE TODAY



Drive in and out through big sliding doors in ends, sides or both. And remember, Butler buildings with steel or aluminum covering are *firesafe, lightningsafe and windsafe!*

Straight Sidewalls . . . Get All The Space You Pay For!

KANSAS CITY, MO.
Birmingham, Ala. — Richmond, Calif.
Galesburg, Ill. — Minneapolis, Minn.

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STEEL PRODUCTS

OIL EQUIPMENT — STEEL BUILDINGS
FARM EQUIPMENT—CLEANERS EQUIPMENT
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☐ Send FREE Butler Farm Building Catalog
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MORE and MORE
Farmers demand ARO
COMPLETE LINE
ARO has the lube-answer for every farm need! Just what you need . . . for faster, better lubrication. Reasonably priced . . . growing popularity! See Your Equipment Dealer. The Aro Equipment Corp., Bryan, Ohio.

"THE HUSKY"—Aro's 10,000 lb. gun. High pressure to crack plugged fittings. One-hand operation. (*Shown above*)

GREASE GUNS and FILLERS

New Model 60032 Farmaster lubricator saves time by delivering more lubricant before recharging. Dispenses from original 25-35 lb. container . . . develops to 6000 lb. pressure. One-hand operation.

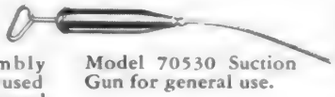
Model 70962 ¼" Filler Nipple

Model 70961 ⅛" Filler Nipple

Model 2030-F Grease Gun, 1 lb. capacity, low priced, for general farm use.

Model 2643 Grease Gun . . . heavy-duty lubrication.

Aro filler assembly 70963 with nipple used with any hand-operated lubricator . . . extra service as gun filler.



Model 70530 Suction Gun for general use.

Model 60048 Gun Filler, 100 lb. capacity. Loads any hand gun equipped with Aro Filler Nipple.

Complete line of grease fittings.

LUBRICATORS

Air-Powered High Pressure Lubricator . . . 60 lb. bulk grease capacity . . . will operate off 1 h.p. compressor. Equipped with 10′ H.P. hose.

Double-Duty Lubricator, hand-operated. 30 lb. capacity. Pump develops to 2,000 lb. pressure . . . used as lubricator, or loading hand gun.

High-Pressure Hand-Operated Lubricator . . . pump develops to 5,000 lb. pressure . . . Can be refilled with entire 25 lb. container.

ARO *The Leader*
IN FARM LUBRICATORS
Manufacturers of Lubricating Equipment for more than 20 years

THE FARM'S PICTURES

JOE MUNROE looks like an outsized radiator ornament as he shoots a pasture seeding job.

Cover by Robert Capa

10—Christian Welker. 12—Fred Knoop. 14—George Laycock. 16—Joe Monroe. 18—Grant Cannon. 22—Joe Monroe. 30 and 31—Caterpillar Tractor Co. 32—Oliver Corp.; International Harvester Co.; Allis-Chalmers Mfg. Co. 33—Fred Knoop; Caterpillar Tractor Co. 34—I. Arons (Sovfoto). 35—B. Losin and V. Ivanov (Sovfoto). 36 and 37—Sovfoto. 38—A. Uzlyan, TASS (Sovfoto); Society for Cultural Relations. 40—University of Illinois. 41—Thomas E. Peter. 42—Strohmeyer & Carpenter. 43 through 45—Joe Munroe. 46—Dr. D. C. Bostwick. 47—USDA. 48—Kazik Pazovski; Drawing, Charles B. Harper. 49—Drawing, Charles B. Harper. 50—Kazik Pazovski. 51—A. E. Holden. 52—Caterpillar Tractor Co. 53—Drawings, Robert C. Smith. 54—Joe Munroe. 55—Kazik Pazovski. 56—Mercury Pictures; Allen N. Crissey. 57—William M. Rittase; Charles Belden. 58—Joe Munroe; Fred Knoop. 59—Kazik Pazovski; Joe Rainaldi. 60—Parsons Brothers. 61—Bob Taylor. 62—Herbert McLaughlin. 63—Cy LaTour & Son. 64—Joe Munroe. 65—Kazik Pazovski. 66—Drawings, Charles B. Harper. 71—John E. Thierman. 72—Fred Knoop. 73 and 74—Kazik Pazovski. 75—Kazik Pazovski; Bettman Archive. 76—Forster Studio; Westinghouse Corp.; Hotpoint Inc.; Kazik Pazovski. 77—Kazik Pazovski. 78—Drawings, Margaret Newland. 79—Leo Litwin; Drawings, Margaret Newland. 100—USDA, Bureau of Entomology and Plant Quarantine. 102—Illinois Natural History Survey.

POULTRY YARD

(Continued from Page 14)

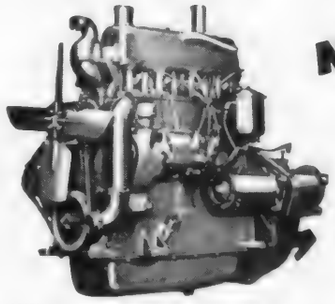
the LOBUND researchers to conclude that their aseptic environment has already given them the growth power which antibiotics gives to normal chickens. The antibiotics *did* produce enlarged thymus glands which would seem to indicate that they influence metabolism, but did not increase the vitamins produced by the birds.

When a strain of germ-free chicks started to stagger about with a jerky gait, which the LOBUND people called chicken jitters, a thorough check was made to find the cause. This disease, they found, could be transmitted to other germ-free chicks, but not to chicks raised in a normal germy environment. Some scientists suspect that a virus, actually a part of the living cell, had caused the jitters, or perhaps the microbes that inhabit the normal chick prevent the development of the jitters-virus in them.

New Massey-Harris 2-3 plow 33

MORE POWERFUL

MORE ECONOMICAL



NEW

MORE POWERFUL . . . bigger overhead valve engine, 201 cubic inches, removable sleeves, positive valve rotators, forced cooling and pressure lubrication.

NEW

COMFORT . . . EASIER CONTROL with Massey-Harris Velvet-Ride Seat and full-width, full view operator's platform . . . offset gear shift . . . handier throttle.

NEW

EASE and efficiency with the Massey-Harris DEPTH-O-MATIC HYDRAULIC SYSTEM . . . 2-way, 2-speed hydraulic control of mounted and pull-behind tools. Powers implements into or out of ground. Assures positive, uniform depth settings.

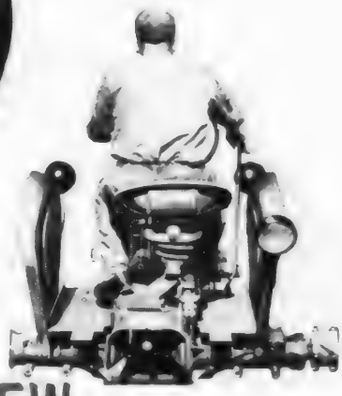
BIGGER . . . more powerful . . . more capable . . . the new Massey-Harris 33 gives you a degree of efficiency never before approached in the 2-3 plow tractor field.

It takes 2 or 3 fourteen inch bottoms around the slopes, up the grades and through the tough spots . . . handles 6- or 7-foot combine, a 2-row corn picker and loaded wagon anywhere in the field . . . takes a 4-row planter — 3-row lister — a 2-row bedder where other tractors bog down. It discs, cultivates, loads . . . does sub-soiling on less fuel.

The 33 puts out more work on the belt . . . grinds feeds, operates the silo blower, pumps water, sprays.

And with its Live Power-Take-Off, the 33 gives you independent control of power and operation. You stop the forward travel of the tractor, independent of clutch operation, and retain full power delivery to the power take off. This means less clogging . . . faster field operation . . . makes your time more productive.

Check the features on the 33 . . . the bigger engine, better traction, full view body design, the Live P.T.O. . . . then see your Massey-Harris Dealer for an on-the-farm demonstration. Drive the 33 under your own conditions . . . get the feel of power and efficiency, the ease and comfort of Massey-Harris design. Like farmers all over the country you'll want to Make it a Massey-Harris. For complete tractor booklet, write: The Massey-Harris Company, Quality Ave., Dept. F-222. Racine, Wisconsin.



NEW

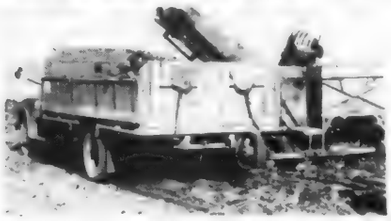
LIVE POWER-TAKE-OFF . . . keeps your combine, baler, chopper or picker running when the tractor is stopped. Reduces clogging . . . eliminates shifting, prevents overloading. Gives you independent control of power and operation. 5 forward transmission speeds.

Parts and Service through more than 2500 Authorized Dealers

Make it a Massey-Harris

"We couldn't do our kind of farming without the EATON 2-Speed Axle"

... says Washington Farmer



"HERE'S WHERE WE NEED PULL," says Mr. Halvorson. His International Harvester finds the going plenty soft and often muddy, and sugar beet loads are heavy. With the Eaton 2-Speed Axle, full loads are moved regardless of ground conditions—no time is lost.

"HERE'S WHERE WE SAVE TIME." — His Eaton 2-Speed Axle enables Halvorson to make long runs to market in less time. The high-range gears make possible good road speeds without abusing the engine and with an important saving in fuel costs. More loads per day can be hauled because of the time-per-trip saved.

BEET FARMER Ron Halvorson of Toppenish, Washington, can tell you what a truck needs to keep a heavy load going when there's six inches of soft loam or mud under the tires.

"No question about it," says Mr. Halvorson, "the Eaton 2-Speed Axle is a must for a farmer in this area. Without it, we couldn't get out of the fields with the loads we put on—we'd bog down. The Eaton 2-Speed keeps us from being held up when the ground is soft. This axle saves us time and money. On the open road we make better time with less fuel, and there's less wear on the engine because it runs at lower r.p.m."

An Eaton 2-Speed Axle makes any truck a better truck for farm hauling. The low-range gears provide the needed pull for hauling over soft ground or rough roads. The high-range gears make possible hour-saving, gas-saving speeds on highway runs with the engine "taking it easy."

An Eaton 2-Speed Axle can save you time, trouble and money — ask your truck dealer for a demonstration.

"HOW'S SHE DOING?" International dealers of Toppenish, Washington: W. C. Hall (*standing left*) and H. H. Harmon stop by to ask Ron Halvorson how that new International is behaving. "Eaton 2-Speed Axles were specified in the last 150 units we delivered," says Mr. Hall.

EATON

EATON MANUFACTURING COMPANY, CLEVELAND, OHIO

2-SPEED *Truck* AXLES

MORE THAN 1½ MILLION EATON AXLES IN USE TODAY

PAR **PROJECT ADEQUATE ROADS:** Let's all help get farm products to market at less cost by speaking up for the better roads America needs.

New Low-Cost Wonder Does All These Summer AND Fall Lawn and Garden Jobs!

The New Faster *Lightning 5 Change* ROTOTILLER

Makes Lawn Mowing a Cinch

In 30 seconds, at amazingly low cost, your ROTOTILLER converts to this wonderful power lawn mower! Cuts velvet-smooth swath 25 inches wide. Leaves no untrimmed edges! Swivels to follow ground contour perfectly! Don't fail to try it *before you buy any power mower!*

Murders Weeds, Tall Grass, Brush

This new 19" Rotary Mower attachment costs less than $75, but will do a perfectly marvelous job of mowing SHOULDER-HIGH weeds, hay, brush—even cornstalks! Leaves nothing to rake! Also does a good job of mowing lawns! Don't fail to try it *before you buy any weed or lawn mower!*

Improves Your Soil—ALL SEASON LONG

With ROTOTILLER'S wonderful NEW "Chopper-Diggers" you can compost-cover and green-manure crops—even garbage—right in your garden itself! This easy way you can be improving your soil all Summer long—all through the Fall! Our FREE 68-page Book tells all about it. Send coupon for your copy.

Turns Leaves Into Rich Plant Food

You'll never burn another leaf when you have a ROTOTILLER! Rototiller's "Chopper-Diggers" make the leaves of just one big tree worth $5 to you! All their mineral and organic richness is chewed right into your garden soil! The FREE 68-page Book tells all about it! Send coupon for your copy.

Makes Beautiful, Beautiful New Lawns

Early Fall is the year's best time for Lawn-MAKING—and ROTOTILLER is the expert's way to do it! Every inch of lawn at the New York World's Fair was made with ROTOTILLER equipment! If you want to make or remake your lawn, be sure to send coupon lower right for FREE 68-page Book. It tells how.

Does the Work of 8 Men With Shovels

You can clear walks and driveways in a jiffy with this Lightning-Change Snowplow attachment—but believe it or not, we sell more of these Snowplows in the Summer than in the Winter! The answer is that it is wonderful for light bulldozing and grading, with the tines to loosen the soil! Costs less than $30!

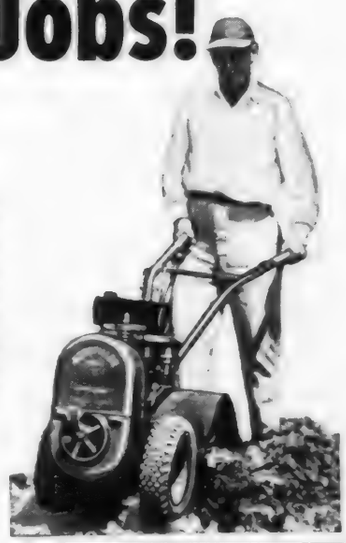
Goodbye Plow, Disc and Harrow

ROTOTILLER'S new "Chopper-Diggers" not only prepare an ideal seedbed in *one easy operation*—they are also ideal for cultivating and for power composting—the mixing of organic matter in the soil Summer and Fall! They'll dig as much as 8 inches deep easily! You'll use them all Spring, Summer and Fall!

Cuts Wood Like a Knife Cuts Butter

ROTOTILLER'S new Rotolectric Chain Saw is a perfect dream! Weighs only 14 lbs., but easily cuts trees up to 20" thick! Wonderful for pruning, cuts whole month's fireplace wood in half a day! Quiet, economical, operates from *any* 1,000 watt, 110 volt A.C. source, or from ROTOTILLER'S own generator! Every farm and country home needs it!

Now You Can Relax and Enjoy Life While Others "Break Their Backs" Trying to Match Your Beautiful Place



THOUSANDS of American families living on little plots of land in the suburbs or country have been discovering an entirely new way of life. This revolution in country living has come about through their use of a remarkable new home power tractor that does all kinds of jobs around the place. Jobs such as gardening, composting, lawn mowing, snowplowing, hauling, spraying, wood sawing, even light bulldozing! Moreover, this wonderful new machines does this work so well and so efficiently that it enables one to do a whole day's chores in a single hour—and at an operating cost of only $1 a day! If you live in the country or suburbs you owe it to yourself and your family to find out just what this year 'round "handy man" can do for *you* and *your* place.

The Simple Story of a Wonderful, New Machine That Is Going to Revolutionize Your Ideas About Country Living

EVERY home owner knows that his chores increase in proportion to the size of his lot or his acreage. That is, if he has any pride in the way his home grounds look and the way his flower and vegetable gardens produce for him.

The American home owner was confronted with two solutions in the past. He could (1) either hire an expert gardener at a cost of $8 to $12 a day or (2) do the necessary work himself.

This meant long hours of hard toil that he had to pay high for, or that he had to undergo himself, instead of playing tennis or golf, go fishing, or just relaxing.

The New 1953 ROTOTILLER is the answer to this country-wide problem. Originally designed as a gardening power tool, the new ROTOTILLER has become a machine that does scores of different lawn, yard and garden jobs. Moreover, it is a machine that takes almost no training to use; and it is so powerfully efficient that even your wife and teen-agers can operate it with ease. (Most youngsters love to use it.)

Saves You Time and Money Every Day in the Year

Only the family owning a ROTOTILLER can really appreciate the amount of time and money that it saves them day after day throughout the entire year!

Take any day in October. You Can make yourself at least $3.00 an hour improving the fertility of your garden by gathering leaves in the big power wheelbarrow attachment and working them into the soil as compost. Or you can make yourself up to $5.00 an hour felling and sawing firewood (or cutting pulpwood) with ROTOTILLER'S new Electricity Generator and ROTOLECTRIC Chain Saw. You may want to grade a new lawn; build a new sidewalk or stone wall. (You can even run a cement mixer with the ROTOTILLER!) Wherever there is a tough job to be done that takes man power and time, the New 1953 ROTOTILLER is your answer.

Costs Little More Than a Power Lawn Mower

Most people, on seeing what wonders can be achieved with a ROTOTILLER, are surprised to discover how little it costs, even with attachments. The Model T-2, with ample power (2½ H.P.) for most lawn and garden uses, is unbelievably low in price. The Model T-3 (with more power and capacity) is somewhat higher in price, of course.

But no matter what you pay, your investment **keeps coming back to you,** in savings on labor and time, **immediately.** Many ROTOTILLER families have been able to save enough in one season's use to repay them **in full** for their investment.

Moreover, your ROTOTILLER dealer will be happy to arrange credit terms so that you can pay-as-you-earn. In fact, many ROTOTILLER owners have been able to earn as much as $10.00 an hour doing special back-breaking jobs for friends and neighbors in their spare time.

Lasts for Years—Needs Almost No Servicing

Modern engineering skill has made the New ROTOTILLER a very simple machine to service. Rarely do breakdowns occur. The engine is nationally known and any local mechanic who has worked on power lawn mowers will be equally familiar with it. Owning a ROTOTILLER is just like owning a new car, and it needs even less care. But let us tell you all about these wonderful new models. The coupon below brings you the complete story FREE.

FREE BOOK BRINGS YOU THE COMPLETE AMAZING STORY!

WE ASKED Ed. Robinson, author of the famous "Have-More" Plan for families who really want to enjoy and profit by country living, to prepare a little book on the New Lightning-Change ROTOTILLER. Ed owns a ROTOTILLER himself and uses it to do all kinds of jobs.

Ed's new 68-page picture book, "How to Do Wonders with ROTOTILLER," tells the whole amazing story a lot better than we can tell it, even in this big advertisement. Ed goes into many other valuable uses for this wonderful machine, such as power strawberrying, mulching, furrowing, hilling, field mowing, lawn making and rolling.

Even if you do not contemplate getting a ROTOTILLER now, you ought to have this valuable book in your library. It's a real eye-opener as to what the right machine can accomplish to make life for you and your family ever so much easier, not only Summer and Fall, but all year 'round!

MAIL COUPON FOR THIS FREE BOOK

ROTOTILLER, INC.
Dept. 97
Troy, N. Y.

Please send me, absolutely FREE and without any obligations, a copy of Ed Robinson's New 68-Page Picture Book, "How to Do Wonders with ROTOTILLER."

Name .....

Address .....

City ..... County or Zone ..... State .....

ROTOTILLER
Reg U S Pat Off

ROTO-ETTE and ROTOTILLER are exclusive trade marks of Rototiller, Inc., Troy, N. Y.

AN OPPORTUNITY . . . A CHALLENGE . . . AN INVITATION TO

Only 250 Leading Farmers

If you are among the top 5% of American Farmers who produce 38% of our national farm income, this message is for YOU.

Will you qualify for and elect to take part in large-scale tests of Hybro-Tite*? Will you be one of 250 leading farmers who cooperate
to help develop new methods of grass
to help find ways to improve yield
corn

Thank you

AMERICAN FARMERS

for your cooperation, your courtesy, in making your own large-scale tests of HYBRO-TITE* Soil Conditioner

You replied by the hundreds when we invited "250 leading farmers" to take part in large-scale tests of Hybro-Tite . . . the natural rock soil conditioner containing potash plus 19 other minerals and trace elements.

We made no gaudy claims; promised no miracles. We said profit possibilities might be large, but on some soils, results might not be exciting.

Thanks to your cooperation, Hybro-Tite is now being tested on thousands of acres from the southern tip of Florida to Massachusetts, and west to the Great Plains.

OTHERS INVITED TO TAKE PART IN TESTS OF HYBRO-TITE

If you have not already ordered a test car of Hybro-Tite, it's not too late. Additional supplies are available now. You can try Hybro-Tite on summer pastures, on groves and orchards, and on Fall-planted crops. See what a difference it may make in your yields.

A NATURAL SOIL CONDITIONER FOR LONG-PULL RESULTS

Hybro-Tite is a fine-ground natural soil conditioner; not a synthetic manufactured product. It may be spread whenever labor and machinery is available, in the same way lime is applied. On some soils you will wish to spread Hybro-Tite plus raw rock phosphate to build up worn-out soils, or soils that never had all the minerals essential for healthy plant life. The potash and 19 other minerals and nutrients in Hybro-Tite are released gradually. "Holding power" may last for years, even on sandy soils.

• • • • •

Send now for free booklet, details of our test offer, and reports from other growers who are using Hybro-Tite. We are supplying 40-ton cars at nominal cost—delivered price $400 to $700—depending on freight rate. In some localities, half cars (20 tons) can be supplied in stop-over shipments. Results on some soils may not be exciting—but on other areas, especially on depleted soils, profits could be large. Write, wire or telephone for more details NOW.

Address: Charles L. Davidson

POTASH ROCK COMPANY OF AMERICA

Lithonia 3, Georgia

*Trade-mark of the Potash Rock Co. of America

FARM BOOKS

The Livestock Book, by W. R. Thompson, Charles S. Hobbs, Richard C. Miller, William E. Peterson, R. W. Pifer. Bowen Press, Decatur, Georgia, $3.50.

Four of the leading livestock authorities of the country and a pasture expert have combined their efforts to produce a concise, thoroughly illustrated volume on the management of each of the four major livestock enterprises—beef cattle, sheep, dairy cattle and hogs.

GOOD LIVESTOCK always look better from the back of a horse.

All the more technical matter found in the standard livestock textbook has been eliminated from this work so that there is nothing to slow down a man in a hurry for information on a practical point. Much of it, in fact, is in picture form. If you're acquainted with W. R. Thompson's "The Pasture Book" that has won such enthusiastic acceptance from farm readers since its publication a couple of years ago, it will be enough to say that this is a companion volume in the same format.

The youngsters, too, will find a lot of inspiration and sound advice in "The Livestock Book." It should be of real value to the FFA or 4-H member launching a livestock project.

An Introduction to Statistical Science in Agriculture, by D. J. Finney. John Wiley and Sons, New York. $3.75.

A wit once said, "There are three kinds of lies: lies, damned lies, and statistics." He probably said this after he had heard someone reel off an impressive chunk of statistics and then offer his own liberal translation of what he had just said. To most laymen it is next to impossible to understand what the statistics mean, let alone decide whether the truth is in them.

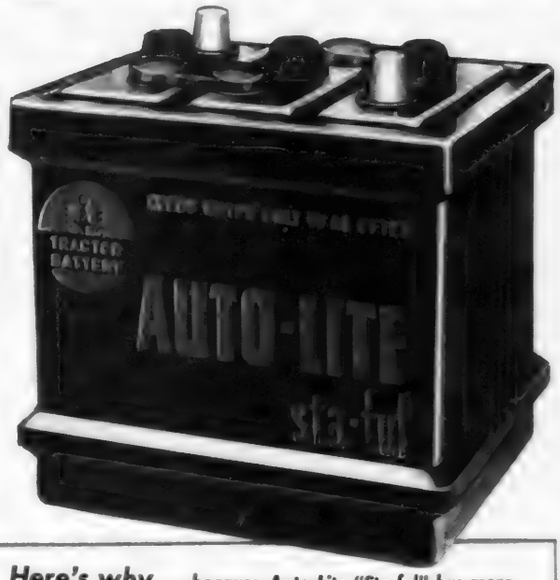
Since much of the science of statistics was created to interpret the results of agricultural experiments it isn't surprising to find our bulletins cropping out with such phrases as "the difference was not statistically significant when subjected to

(*Continued on page* 68)

NEEDS WATER ONLY ⅓ AS OFTEN

NOW! AUTO-LITE STA-FUL BATTERY

built for the roughest tractor duty . . . lasts longer, too!



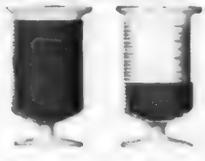
Now the famous Auto-Lite "Sta-ful" Battery is available, built for toughest tracto , light truck and other off-the-road service. Extra rugged case is made to withstand heavy shocks! Fibre-glass insulation and super-strength construction assure longer life. And the famous "Sta-ful" extra liquid capacity saves you time and worry . . . needs water only 1/3 as often. Ask your Auto-Lite Battery dealer for the new Auto-Lite "Sta-ful" Battery for tractors . . . Money cannot buy a better battery. You're always right with Auto-Lite.

Phone Western Union
. . . ask for "Operator 25" . . . she'll give you the name of your nearby Auto-Lite Battery Dealer. There is no charge for this service.

AUTO-LITE
sta-ful battery

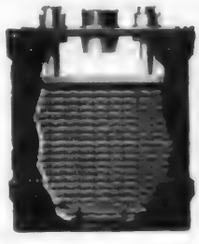
Here's why . . . because Auto-Lite "Sta-ful" has more than 3 times the liquid reserve of ordinary batteries . . .

Liquid reserve of Auto-Lite "Sta-ful" is over 14 oz.



Liquid reserve of Ordinary Batteries is less than 4 oz.

after equal evaporation this happens . . .



Auto-Lite "Sta-ful" plates are fully covered and active.

Ordinary Battery plates are exposed and partially inactive.

TRENCH SILOS AND OTHER TEMPORARY SILOS ARE EFFECTIVE UNDER IDEAL CONDITIONS

however The Best and Cheapest Silos in the Long Run are PERMANENT STEEL SILOS

TRENCH SILO

ADVANTAGES: Some saving of time and labor in filling and emptying, if farmer has the right equipment.
Less costly if the trench silo is crude and is to be used for only a short time

DISADVANTAGES: An adequate trench silo costs as much or more to build and maintain per ton of capacity as the best upright silos — unless the trench silo is built large enough to hold 1,000 to 1,500 tons or more.
Lessened feed values.
More spoilage from air.
More labor in carrying silage to animals.
Waste in self-feeding by loss under foot.
Acids gradually dissolve lime from the concrete walls and floor.

STACKED SILAGE

ADVANTAGE: No cash outlay for materials.
Less labor in stacking than in filling an upright silo.

DISADVANTAGES: Greatly lessened feed values.
Much more spoilage.
Less palatable.
More labor in carrying silage to animals.
Waste in self-feeding by loss under foot.
If not stacked right, the whole stack may be lost through spoilage. Grass is much harder to pack tight in a stack than in an upright silo.

See your Silver Shield and Buckeye Dealers, or write for more information.

CLAYTON & LAMBERT MFG. CO.
1704 Dixie Highway, Louisville, Kentucky
Also Manufacturers of Buckeye Corn Cribs and Grain Bins

Please send me information on Steel Silos for:
☐ 13 Cows ☐ 15. ☐ 17. ☐ 20.

Also send free Silo Folder showing different diameters and heights.

Name: .....

Address: .....

We heartily recommend temporary silos if the weather is good and if your silage is to be stored for a very short time only. But, if you plan to use silage year after year—temporary silos will eventually cost you a great deal more in spoilage, lost feed values, and repairs than a permanent, profit-making, upright Silver Shield STEEL SILO—Guaranteed for 20 years.

ADVANTAGES OF SILVER SHIELD STEEL SILOS

MOISTURE PROOF—Rich silage juices can't leak away. AIRTIGHT—no side-wall spoilage losses. FIREPROOF, WINDPROOF, ROT PROOF, RUST RESISTANT, EASILY ERECTED. SMOOTH INSIDE SURFACE permits settling and packing. LOCATION—close to barn and feeding troughs. Silver Shield Steel Silos can be taken down, moved and erected at another place.

GOOD SILAGE FROM SILVER SHIELD STEEL SILOS OFFERS THESE GREAT BENEFITS:

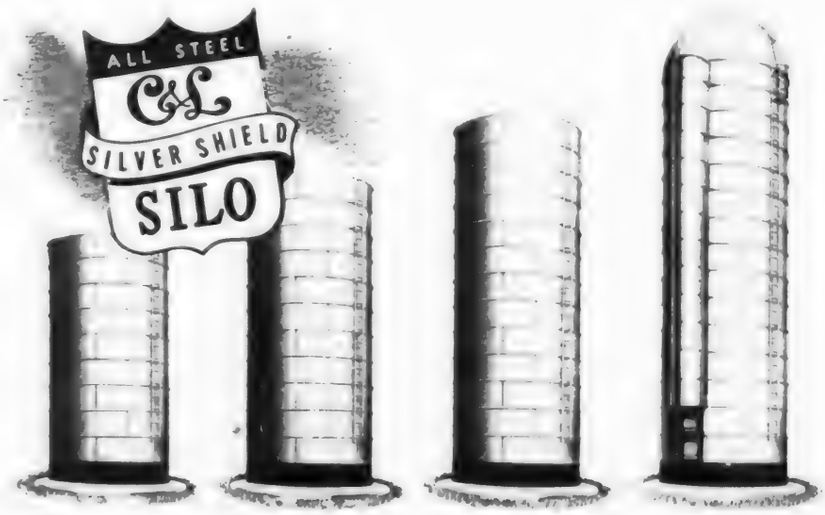
Increased nutritional values through complete fermentation.

Longer storage in excellent condition to provide year- round pasture.

More succulent. No spoilage around outer edges. Quick thawing in freezing weather.

Less labor in feeding to animals.

Takes smaller quantities to provide the same nutrition.

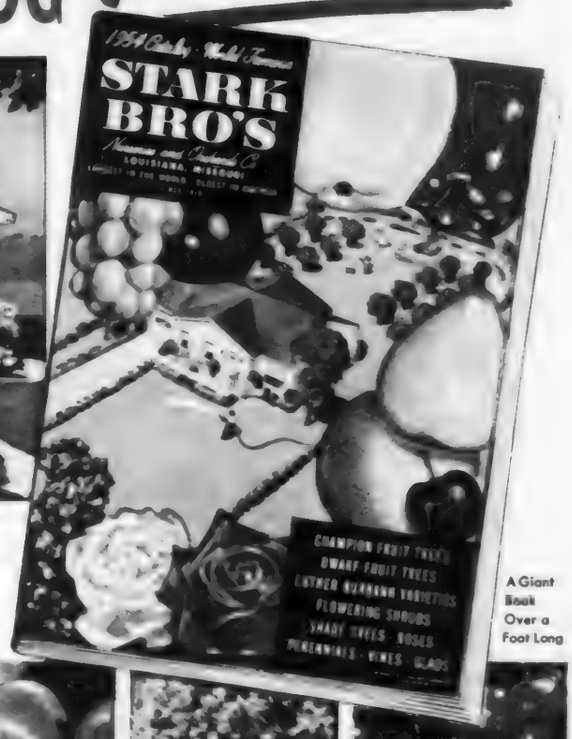


11½' x 25'	11½' x 30'	11½' x 35'	11½' x 40'
AS A START	ADD TWO RINGS	ADD TWO RINGS	ADD TWO RINGS
1953	**1954**	**1955**	AND ROOF **1956**
AROUND $850	AT NOMINAL COST	AT NOMINAL COST	AT NOMINAL COST
13-COW CAPACITY	15-COW CAPACITY	17-COW CAPACITY	20-COW CAPACITY

You can start with a small unit and add to it later as you increase the herd or the livestock carrying capacity of your farm. An investment that will yield profits for a lifetime, in addition to improving the sale value of your farm. Silver Shield Silos — for grass and corn silage.

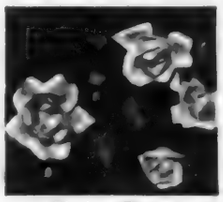
CLAYTON & LAMBERT MFG. CO., LOUISVILLE, KENTUCKY

Send for Newest Edition Famous STARK BRO'S 64-PAGE LANDSCAPE-FRUIT COLOR CATALOG FREE!



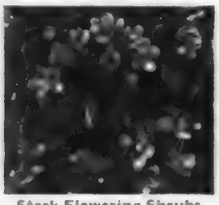
A Giant Book Over a Foot Long

Exciting New FREE BOOK Tells How to Save Money and Surround Your Home with Nature's Colorful Beauty All Spring, Summer and Fall



Glorious Roses
New varieties or old favorites, rose lovers will find them in all their colorful, fragrant glory!

Stark Apples
Exclusive varieties Stark Golden Delicious and Starking Delicious. Giant size, luscious.



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Color and fragrance from early spring to late fall with glorious Stark Flowering Shrubs.

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New Stark and Burbank exclusive Patented varieties. Yellow, White Fuzzless types.

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Extra hardy Stark Hedges and Shade Trees. Long, full root systems for rapid, healthy growth.

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Grow super quality Stark Cherries, Plums, Pears, Grapes and other extra size fruit.

DWARF FRUIT TREES and Standard Fruit Trees

Exclusive Trade-Marked and Patented Varieties. Stark U.S. Patented Quadruple-Life sensational New Dwarf Apple Trees give ideal flowering effect . . . often bear in 2 years, bear heavily with finest, biggest fruit. Plant several in tiny backyard "vest pocket" space.

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John W. Simmons, W. Va., has earned big money spare time during past 21 years selling Stark Trees, Shrubs, etc.

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Quonset drying and storage permits earlier, cleaner harvest, better market control for W. R. Mitchell, Grundy Center, Iowa
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Avoid harvest time glut . . . get more for your grain with on-the-farm Quonset storage. Chart shows monthly corn prices for the 1951 crop year.

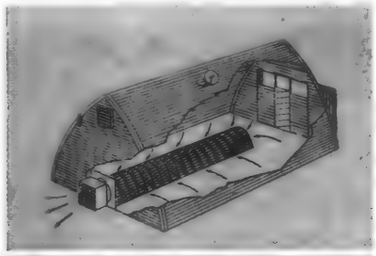
Quonset owner leads the way to greater grain profits

W. R. Mitchell, tenant farmer, of Grundy Center, Iowa, views with pride his 1952 corn crop—the first corn picked in Grundy County last year.

Because Mr. Mitchell used a Quonset combination ear corn drying unit and granary, he was able to begin picking his corn on September 27—at 30% moisture content—up to 30 days before his neighbors. Mr. Mitchell reports his picker left less corn in the field, his corn borer loss was minimized and he no longer worries about a wet fall when the corn is slow to field-dry.

This Quonset 32 x 60 dried 5,500 bushels of ear corn and its smaller bins held up to 4,000 bushels of other grains. The farm owner purchased this size because it provides ample separate bins for his own share of the crop, as well as Mr. Mitchell's.

Like this owner, thousands of farmers have found that grain can be safely stored right on their own farms . . . held until market prices are right or the grain is needed for feeding. Quonsets are available for any capacity—1005 to 50,000 bushels. They are easy to finance on the Quonset Purchase Plan or through CCC Storage Facility Loans.



This Quonset 16 Granary, complete with fan-and-tunnel "package" lets you dry and hold your grain.

Consult your authorized Quonset Dealer . . . a specialist in farm service buildings, or write us direct for complete information on the Quonset best suited to your operation.

Good-looking, durable and easy to maintain. That's the Quonset . . . all-purpose farm production tool.

"My farm machinery is easier to service," says Endren P. Johnson, Huxley, Iowa, of his Quonset.

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Beef barn owned by A. W. Allely of Montezuma, Iowa, is a time-saving, labor-saving Quonset 40x60.

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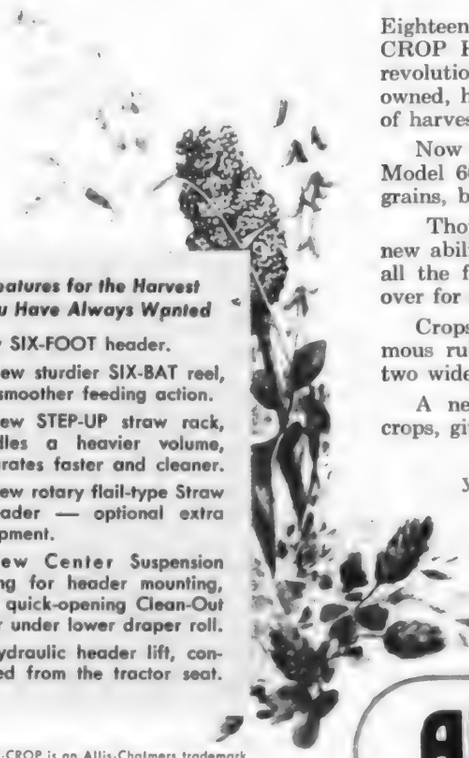
It's Here! For a Golden Home Harvest in '53 . . .

NEW MODEL 66 SIX FOOT

ALL-CROP Harvester



Features for the Harvest You Have Always Wanted

New SIX-FOOT header.

New sturdier SIX-BAT reel, for smoother feeding action.

New STEP-UP straw rack, handles a heavier volume, separates faster and cleaner.

New rotary flail-type Straw Spreader — optional extra equipment.

New Center Suspension Spring for header mounting, with quick-opening Clean-Out Door under lower draper roll.

Hydraulic header lift, controlled from the tractor seat.

ALL-CROP is an Allis-Chalmers trademark

Eighteen harvests ago, Allis-Chalmers introduced the ALL-CROP Harvester, "Successor to the Binder." It brought a revolutionary change in harvesting methods. Today, the home owned, home operated small combine is the accepted method of harvesting on family farms throughout the nation.

Now comes a new Six Foot ALL-CROP Harvester — the Model 66 –bringing a still higher standard of harvesting for grains, beans, sorghums, and soilbuilding seed crops.

Though the Model 66 has increased capacity and many new abilities, it will not seem a stranger. In it you will find all the familiar features that have earned friends the world over for the ALL-CROP Harvester.

Crops travel in a broader Wide Flow stream to the famous rubber-cushioned bar cylinder. You can easily harvest two wide-planted rows of soybeans or sorghums.

A new Step-Up strawrack boosts capacity in over 100 crops, gives straw a faster, rougher ride; separates cleaner.

If you own an ALL-CROP Harvester, 1953 can be your Golden Harvest year!

"No Other Harvester Has Done So Much for So Many"

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Shipping Fever Protection

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Simply inject 10 cc under the skin at neck or shoulder, 14 days before exposure. Worries over, your cattle profits assured. Routine Anchor vaccination of all calves 6 to 18 months of age will pay off for you. Complete directions on every bottle.

NOW IS THE TIME

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THE Lightweight CRAWLER WITH A HEAVYWEIGHT PUNCH

JOHN DEERE "40" CRAWLER

IF YOU have special conditions —rough, swampy ground, steep hillsides, difficult soils, where extra stability and extra traction are needed—you will want to investigate this new "little giant" among track-type tractors. Successor to the John Deere "MC" 2-3-plow tractor, it brings you 15 per cent more horsepower . . . new, more practical styling . . . new comfort and convenience . . . new accessibility . . . and other advancements, including faster reverse speed, larger fuel tank, and new, larger diameter pulley for smoother, more efficient belt work.

On every job . . . in fields, in orchards and vineyards . . . for logging work in the brush . . . on construction sites . . . wherever requirements call for low-cost, easy-to-handle track-type power, the new "40" Crawler fills the bill. "Live" hydraulic Powr-Trol gives you effortless operation of both integral and drawn equipment . . . combination steering-braking mechanism provides short turning, greater maneuverability . . . and there is a rugged, integral tool carrier available for handling a wide variety of working attachments, including bulldozer.

The sure-footed power and four forward speeds of the "40" Crawler are just right for handling many heavy tillage tools and earth-moving equipment. Its low, compact construction adapts it to working in tight quarters. Approximate weight is 4,000 pounds. Regular equipment includes starter, battery, generator, adjustable seat, power take-off, fenders, and sod-pan. See your John Deere dealer.

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Crawler Tractors

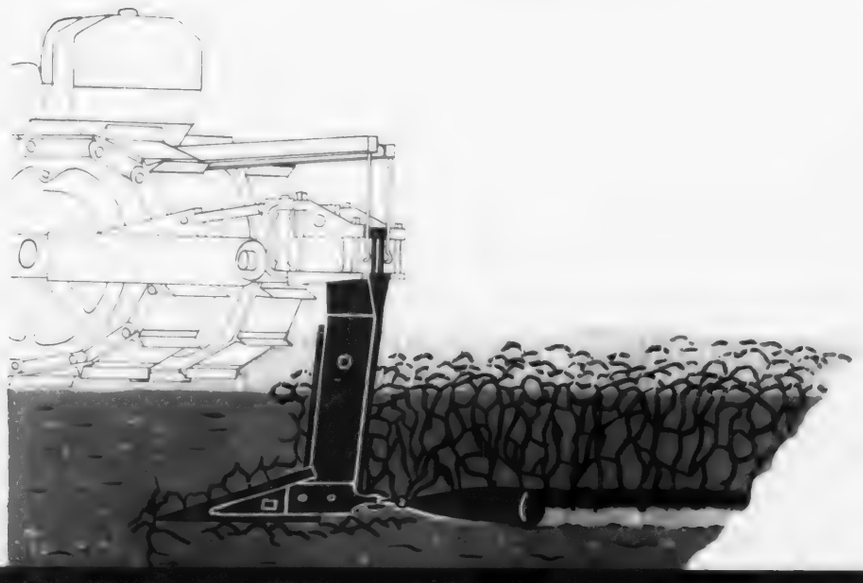
In the Midwest, many a farmer has become a crawler tractor owner because he had a job to do that was tough and he found a crawler was even tougher.

Take George Theilen of Chatham, Illinois. In 1949, he hitched up to his three-furrow 14-inch bottom plow and rolled out to turn under what had been a fine brome-alfalfa pasture for corn. The grass glistened with dew and the ground was just right for good, clean furrows. The rachets on the plow clicked as she rolled over and dropped the points in the ground.

"Those roots were woven together like a rug," says Thielen, "and I sat there with the wheels spinning, with power to burn. A new set of plow points cost twenty dollars and didn't help much. I had a neighbor who had a crawler tractor and a few days later he turned the field for me. I guess I was already a pretty good prospect when I walked into R. W. French's in Springfield on a rainy day in June.

"Our Caterpillar D-2 Tractor has been a good investment and it gets used for most of the heavy work on our 350 acres. We hitch it up to the forage harvester, where live power take-off and slow ground speed make it a good combination. We like to use it

Crawlers and the heavy-duty tools they can pull are saving time and labor on big farms



THE CATERPILLAR D-2 Tractor shown on the opposite page is pulling a subsoiler and mole (the tear-shaped attachment) at a depth of 24 inches on the farm of Carl Friedricks in Minnesota. The diagram above shows how this toolbar attachment cracks the subsoil and provides better water-holding capacity. Plant roots, too, can get down deep after the hardpan is broken up.

By Fred Knoop

on as many jobs as we can because it is cheap to operate. We figure the fuel oil it uses costs about half what our big gasoline tractor burns. We use big tools with it—a Graham Hoeme plow, a Towner 9-foot disk, and we pull a four-furrow 16-inch plow. Tracks seem like an expensive idea at first because when they go clanking over the field, it sounds like something is going to fly loose. But now I think they are cheaper to use than rubber tires for rough work: you don't have to worry about snagging a tire on a stump and we've never yet replaced our original tracks."

Farmers have shied away from "bulldozers" for field work for a variety of reasons: their high cost, unsuitability for high row crops cultivating, slower speeds, laws that keep cleated tractors off highways, lack of nearby dealers to provide service. These all are points that have to be weighed before taking on a crawler tractor. (Incidentally, users soon find out that "crawler" is the right name—for the term "bulldozer" is correctly applied to the big blade and its controls, usually attached to the front of the tractor. For special jobs the blade can be rear-mounted.)

The advantages of crawlers—and they are as big as the machines—can best be applied to big farms. A figure of 300 acres of cropland is one manufacturer's idea of how big a farm should be to make a crawler earn its keep. But in hilly farm country in Pennsylvania and along the Appalachian foothills into Virginia and to the West, orchard men have found that the big per-acre value of their crop makes crawlers good tools on even smaller farms. Jim Harris, a fruit grower along the Ohio River, stuck with horses in his orchard a good many years after the rest of his farm was on rubber tires. "With apples," he says, "you've got to get the sprays on at the right time whether the ground is bogged down or dry. That's why we kept the horses. Then we saw West Virginia fruit growers working with crawlers on slopes that made ours look flat. We got a small International with orchard fenders, a TD-6, and let the old team go. It hauls our big Bean Sprayer—and it weighs nearly three tons loaded—through the orchard in

CLEARING LOCUST SAPLINGS and briars goes fast with an Oliver BG gasoline tractor equipped with a Heil Bulldozer; a good operator can take out an acre of brush in a couple of hours. The trick is to keep the blade just below the ground. With too much depth the topsoil is skinned off; with too little the trees are only bent over.

the worst weather. Out of spray season, we use it in the fields and with a spring tooth cultivator to work out the weeds around the trees. We've found plenty of use for it on our 108 acres."

Where Crawlers Work Best

Usually the crawlers are best suited to the big operations. Their four basic advantages are:

Husky Power—Many crawlers are equipped with Diesel engines which will supply enough power to pull the biggest tools and multiple hitched implements. That saves time: one man can do the work of several men on smaller tractors. Big tools will work the ground deeper, even down 3 or 4 feet to break up the hardpan.

Traction—Nothing but oozing mud stops a crawler, for it lays its own roadbed and spreads the pull over a large ground area. It can deliver steady pulling power even on sand, silt or muck soils. For any given horsepower, a crawler can deliver more usable power to the drawbar, for slippage of the track is about 3% against a wheel tractor's 10%. Crawlers can work earlier in a wet spring and later in the fall, even after the first snow. On the West Coast, where four crops a year are grown in many areas, the all-weather use of the crawlers makes them an important tool in keeping on schedule.

Low Center of Gravity.—The heavy tracks and underslung construction of crawlers puts their center of gravity down around 12 to 18 inches, against a wheel tractor's 2 to 4 feet. In hilly or rough country, a crawler can work ground that would be unsafe for a wheel tractor.

Better Weight Flotation—A big crawler will put about 5 pounds weight on each square inch of ground it is riding over. Smaller crawlers put less weight than this on the ground. Wheel tractors put 20 to 24 pounds per square inch. Compared with a horse, a crawler is as light as a ballet dancer, for horses will put 25 pounds of weight on a square inch of earth. Soil compaction is less with the use of crawler tractors.

Farmers have put crawlers to work where any one of these advantages is an important factor in getting the work done. The pattern of the number of owners fits fairly well into the soils, slopes and size of farms: in Pennsylvania, with lots of hills, 1 out of 30 tractors is a crawler; in Iowa, where medium size farms predominate 1 out of 100; in Florida, big acreage and lots of sand, 1 out of 20; in Idaho, rough winters and big ranches, 1 out of 7; in California with big acreage and soft soil, 1 out of 3. But California does things in a big way and the big crawlers fit right into the picture. Readers of the Earthworm tractor stories that ran in the *Saturday Evening Post* will remember that Alexander Botts, the roving salesman, considered California just a little this side of Paradise for selling Earthworms.

What Do They Cost?

About the best way to get the cost figures on any crawler, is to go to the nearest dealer and let him figure out the price. In the first place, crawlers are heavy and they are priced F.O.B. the factory. By the time the freight is collected from Illinois to South Carolina, it is easy enough to add $500 to the cost. Crawler prices start with

CRAWLERS hang onto hills where wheel tractors can't navigate. The International TD-9, below, is pulling a heavy-duty McCormick offset disk harrow.

A DOUBLE HITCH being used behind an Allis-Chalmers HD-5 Diesel crawler. The plows are each five-furrow, 16-inch bottoms. With this rig up to four acres an hour can be turned.

the engine, the track, the controls and the seat. Second, there are so many variations in the way they are to be used, most of the equipment is added and installed by the dealers. The baby crawlers—and husky babies at that—are the John Deere "40" and the Oliver OC 3, with 20 to 21 drawbar horsepower, according to the Nebraska tests. They cost about $2500 with hydraulic lifts, in most Midwest areas. Extra wide tracks will add to this basic cost. Extra high clearance for row crops can be built into these small tractors. These are gasoline tractors. Oliver and International supply certain of their crawlers with either gasoline or Diesel engines. Allis-Chalmers and Caterpillar are Diesel throughout the line. Stepping up to the 25 to 32 horsepower International, Caterpillar, Allis-Chalmers and Oliver, the the prices will jump up to $4000 to $5000, in the gasoline engine models. With Diesel engines, they go up another $500 to $1000, and the Cat D-2 Tractor can be equipped with hydraulic lift and tool bar within this price range.

The next power range is for the tractors in the 40 to 45 horsepower class and the prices will range from $6000 to $7500. If there is big acreage and big tools to be handled, you can keep right on going up in horsepower. A Caterpillar D-6 Tractor, which delivers over 65, will cost around $10,400 with the hydraulic unit and tool bar, F.O.B. Peoria.

How They Work

The tracklaying tractor is not a new idea. In 1770, an Englishman named Edgeworth, was granted a patent for "a portable railway or artificial road to move along with any carriage to which it is applied." It was in agriculture that the tracklayer really got its start. In 1903, Benjamin Holt was looking for a way to keep his steam tractors from sinking in the soft peat-like soil of the California valleys. His 20-ton steamers had wheels 7½ feet in diameter with a total width of 45½ feet. Even though they would harvest as much as 125 acres a day with a combine hitched behind, the customers complained "they're hard to get through gates," or, "they wear you out steering them."

Holt created his first steam drive tracklayer in 1904. It had 40 h.p. and could pull four gangs of plows. In 1906, Holt built his first gasoline crawler and called it a "Caterpillar."

It was the ponderous British Army tanks of World War I that caught the public eye and the principle of the crawler was quickly accepted after the war for all kinds of road-building equipment. In 1932, the first Diesel crawler—made by Caterpillar—went to work in April on an Oregon ranch. For 46 days it ran continuously, plowing 150 acres a day. When it finished 6880 acres later, the fuel cost had been 5.73 cents per acre. Cutting 80% off the fuel bill was big news and was

(*Continued on page* 94)

LAURENCE FINDLEY of Seymour, Indiana hardly ever lets his John Deere MC crawler cool off. In the summer it is used for field work and in the winter it drags logs to the farm sawmill.

THIS IS the second model Caterpillar Tractor, built in 1908. Benjamin Holt is at the wheel. A number of scoffers came to watch the hill-climbing demonstration. They went home agreeing that it might be a substitute for horses.

2/3 of what the Russian farmer produces goes to the State; 1/3 is divided among the farm collective workers

Farming in Russia

By Basil Kotov

I left Kiev, the capital of the Ukraine, a week before the first Germans on motorcycles rode in with their machine guns. Our people left Kiev in waves, shoved along by the panic of frightened refugees, who said the Germans were killing everything before them.

I was blind in one eye from birth and my Ukrainian mother, who always hated the Germans, was afraid they would put out the good eye if they caught me. We left, too, going toward the east, toward Moscow, which we thought to be safest. In the stream of people I got separated from my mother and looked for her all that night. She will go to Moscow, too, I thought.

I got to Moscow by walking, by train and by truck. On the way, transports filled with troops passed me going west to fight the Germans. The soldiers wore round caps with quilted cotton sewed in to keep their heads warm, and large ear flaps which could be pulled down. On the front was a Red Star. The faces of the soldiers were pale. When a transport stopped, women along the side of the road would cry, but the soldiers paid no attention, looking straight ahead.

I was too upset to be very much frightened by a danger I could not see. Mostly, I wanted to see Moscow, our capital. Twenty miles away from the city I climbed on a freight train that had stalled when a German Stuka strafed the tracks. An emergency railway official with a red band sewed on his arm saw me climb on and asked me for my passport. I was not yet sixteen, so had none. He told me to go a kilometer down the tracks to a suburban railway station. In such times, railway waiting rooms become public hotels or military offices. I was fourteen, but there were younger boys and girls, lost from their families, sitting on the marble floor. I was glad that now someone would tell me what to do.

That night, with many others, I was put on a train and shipped east to Kirov. There, three of us were told to go to Voronye, which means The Crows, a village of 162 families. It was a collective farm, a *kolkhoz*, of 2500 acres, where I would be given work as a farmer. From Kirov to Voronye was 40 miles and we were expected to make it as best we could.

The way to Voronye was a cart road that led through a forest. We had no food, but we each had our tin cup at our belt, our spoons in our boots, and a big appetite. By nightfall we had covered many kilometers.

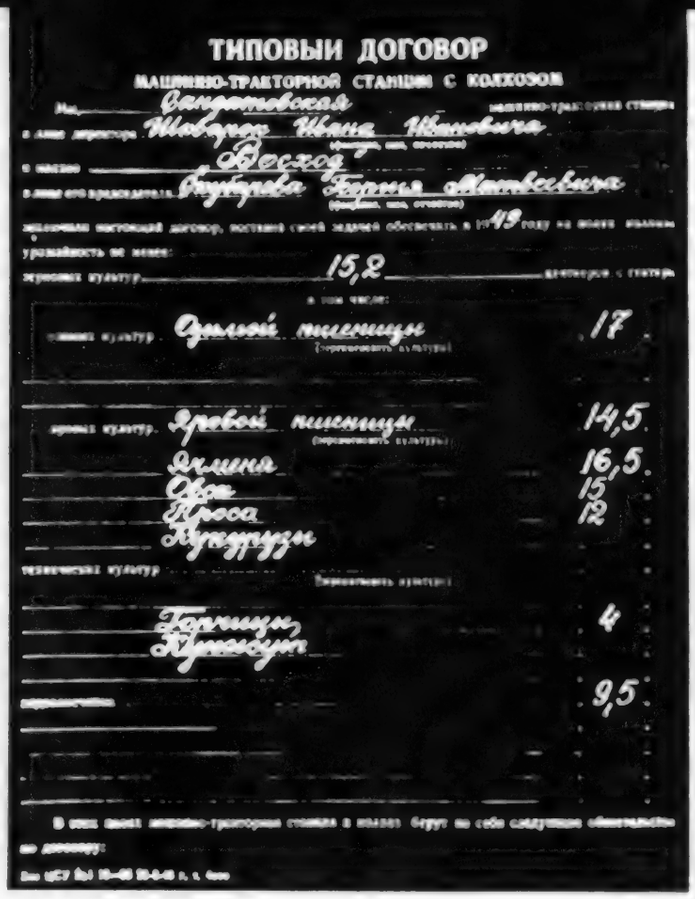
The moon was above the forest oaks when we saw the first home of a peasant. This man, Piotre Pietrovich used one hectare belonging to the State; it being poor and isolated. He felt abandoned because he and his wife lived alone on this small plot on which they could hardly raise enough to live. The ground was stumpy and full of roots. To farm it, the peasant had a wide spade, himself and his wife. They grew carrots, cabbage, sunflowers, red beets, potatoes. They saved the peelings of the potatoes and planted the eyes in the spring. Mushrooms grew in the woods, and they had a sow and four pigs. Piotre said that God and he made the crops grow; that was the science of it. Piotre knew the poems of Pushkin and Lermontov and the fables of Krylov. He asked us to put in a good word for him when we joined the collective farm at

Voronye, so that he could join it, too, for he and his wife had too few acres to provide food the year round. He could sell what he raised in the free market at Kirov, but he had no way to carry his cabbage and beets. He had no horse, because horses are "power." This would raise him above the horseless citizen; he could produce more for himself, and soon he would become rich, and a landlord, a capitalist, a millionaire, and then the Tsarist troubles would start all over again. This, he said, was told him, but still he was sad that his old mare was taken.

It was cold that night and Piotre Pietrovich invited us to sleep on the stove. The Russian stove is wide and it runs the great length of the room. The top is of brick, easily a foot thick, with a fire pit and oven under it. On a cold autumn night it is a good place to be. We slept there with the farmer and his wife. In the morning she went into the woods and gathered mushrooms for a fine, hot mushroom soup. I sat in a corner and started to carve a spoon, because I had lost mine along the road. As I whittled, I watched her make the soup.

At breakfast, Piotre told a fable of the fox and the crow. The crow sat on a limb with a tasty piece of cheese in its beak, and the fox, very hungry, sat beneath him. "Ah, pretty crow," said the fox, "your feathers are dark like the night and they glisten as though moonbeams were on them." The crow opened his beak in pleasure and the cheese dropped to the ground and the fox grabbed it up and ate it. "From this you will learn," said Piotre to me, "speak well to your leader at Voronye so you may eat well."

We left after breakfast, and late that night we reached Old Voronye. The one room houses and small barns were built of long logs, low and dark, huddled together and leaning and rotting down.


ТИПОВЫЙ ДОГОВОР
МАШИННО-ТРАКТОРНОЙ СТАНЦИИ С КОЛХОЗОМ
Сандатовская
Шаврова Ивана Ивановича
Восход
Бутурова Гарния Аникеевича
49
15,2
Озимой пшеницы 17
Яровой пшеницы 14,5
Ячменя 16,5
Овса 15
Проса 12
Кукурузы
Гречихи 4
9,5

This contract between the Sandatovsk Machine Tractor Station and the Voskhod Collective Farm in the Rostov region agrees to carry out certain field work—plowing, cultivating, and harvesting. The quality of the work as well as the time is specified.

Now, no one lived in Old Voronye. But the State had preserved it for all to see.

So had the Russian peasants lived—bad odors, small windows, no cellars, and no Plan. We were depressed by the ghostly sight and hurried on three miles to New Voronye. Here were all new log homes, many with one room downstairs and two rooms upstairs.

We went to the Red Center, where there was a clubroom and the offices of the collective. There were boys and girls there, dancing, and some men were playing chess at tables along the wall.

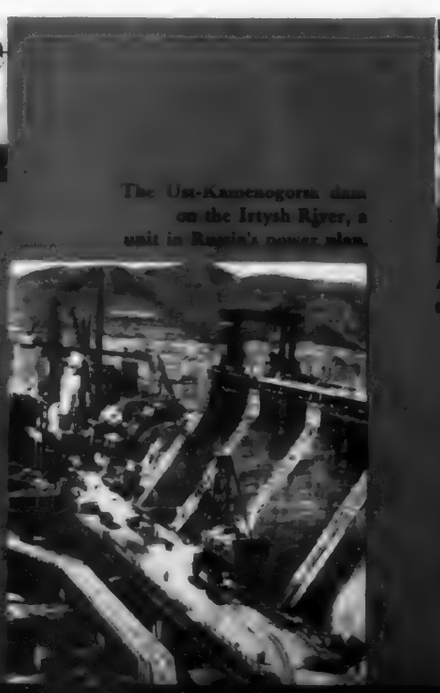
I was introduced to my leader, who explained the Voronye kolkhoz to me. "Here," he said, "we are all partners in one venture. Each job on the kolkhoz has a value assigned to it. To load manure, to plow or disc with a horse, to glean, or to watch the sunflowers to see that no seed heads are stolen—jobs like these have a value of one workday credit, or less. Other jobs have higher value. You will work with twenty other comrades under a brigade leader. I am your brigade leader." He smiled at me.

"Am I paid at the end of each day's work, then?" I asked.

"In a sense, yes," said my brigade leader. "And in a sense, no. You will be assigned to the household of Akim Akimovich. Behind his house is a plot of ground, 40 meters square. This he works in his spare

Gsulbor Davidova wears Stakhanovite medals.

Cows average 4,500 lbs. of milk on a dairy near Moscow.


The Ust-Kamenogorsk dam on the Irtysh River, a unit in Russia's power plan.

A work brigade making hay on Iska Collective. About 60% of the workers are women.

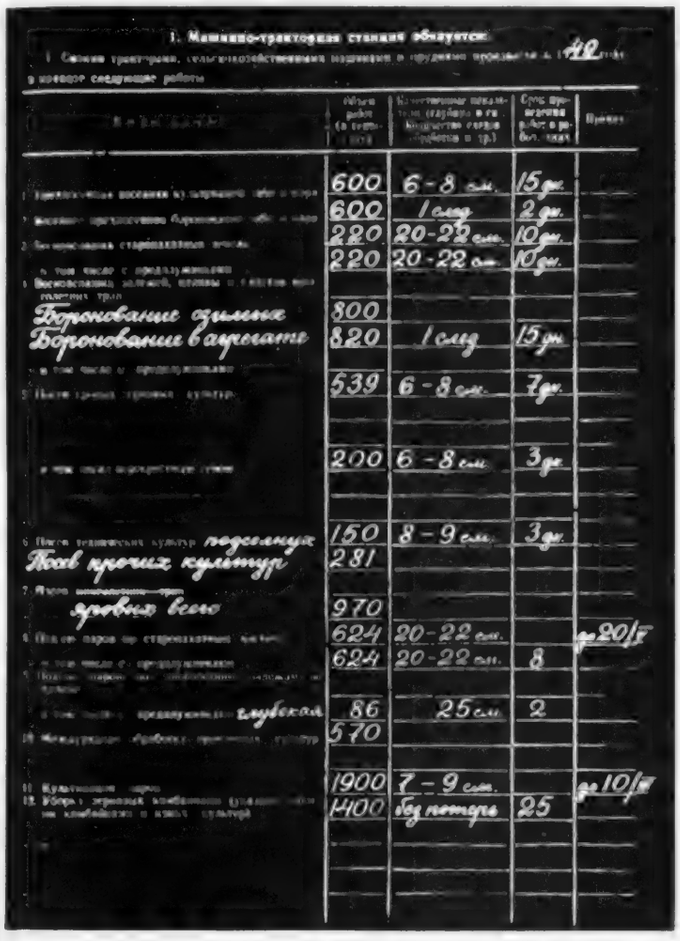
Heifer calves of the Kostroma breed being reared on dry feed, in individual homes. They are dual-purpose animals.

An electric tractor is tried out near Kiev; its range is

time. And what he raises there belongs to his household. You will now belong to his household and to eat from his table you will share the work of raising food from his plot."

"But of the kolkhoz work I do all day? Am I paid for that?"

"You are a partner," said my brigade leader, "and you share with us all. Because you are new and have much to learn, you will begin by walking beside a plow, and then in two days you will plow. Each day's work gives you one workday credit. Our kolkhoz sells sunflower seeds, wheat and beets to the State. About two-thirds of what we raise goes to pay our tax for the land we use, and for farm supplies we receive from the State: also this pays our contribution to the Red Army Fund and for the machinery work we order done by our Machine Tractor Station. This Station does all our heavy tractor work and serves not only us but four other farm collectives."



Crops will be sunflower, sesame, winter wheat, mustard, maize (Indian corn), oats, barley and spring wheat. Of 4000 acres in the collective, approximately 3000 acres are in grains. The MTS will take about 20% of the crops as machine rental.

"Then, the other third of what we raise is ours?" I asked.

"You are a partner," said my brigade leader," and you share equally for what you have done. The third that is usually left us may amount to 200,000 rubles. Here at Voronye, there are 200 workers. Some workers earn 300 workday credits a year; some earn 400: others earn 600 workday credits a year. In the years when comrades do not work hard, or the weather is dry, a workday credit may be worth only one ruble. In good harvest years, it may be worth three or six rubles. You will receive a ration book, and with this and your rubles you may buy what you like at our store here, or at Kirov at the end of the harvest season."

"I have lost my mother," I said, thinking now only of her. "How may I go to find her?"

"She has a passport? Where do you think she went?"

"To Moscow, I truly hope."

"Then, we will write the proper authorities there," said the brigade leader.

"Give me her name, her number, her nationality, her education, her police record, for all this appears on her passport and from it she will be identified. Then, we will bring her here to work with you. Passports help our people find each other when they are lost."

"Could I go to Moscow some day to look for her?"

"You are a partner here, a man now. We will take care of you and you will take care of us. Now, we have plowing to be done. Lucky for us, the freeze is light. When there is time, and you receive a written card stamped by the Predsediatel of the Voronye collective and the Predsediatel of the Machine Tractor Station that serves us, you may go to Moscow to look for your mother. To go without this would be bad for you; you would be fined many

Stalin Prize winners. The award: "Alexandra Lyuskova and assistants scored a world record in pork yield from one pig."

A battery of electric sheep shearers on a collective farm. The brigade leader reports to the collective chairman.

Shepherds take their herds to summer pastures. A comrade reads the news during a stop for food.

Sowing winter wheat on a Moldavian collective, with Russian-made tools.

Brigade leader of a Kirghiz sheep farm, a hero for great achievement

over-fulfilled quota, became Socialist hero.

work day credits for failing your comrades when they needed you. Be of good hope and think of today."

The assistant brigade leader, who stood by, said solemnly but not unfriendly: *"Niet raboty, niet kushhania."* "No work, no eat."

I was sent to the home of Akim Akimovich. He had a son of my own age and a small baby. That night I had potato pie, beet soup, and hot weak tea with a big piece of bread.

The farmer's son and I slept on a shelf above the long stove on the first floor. The shelf was as long as the room and six feet wide. It was covered with straw mattresses. We needed no cover, as the stove was hot, and the shelf was four feet above it, where the air was still and warm throughout the night. When the farmer's wife gave me a goose-feather pillow, she sing-songed an old saying, "If I were king, I would do nothing but sleep on the stove and eat bacon."

In the kitchen fastened above the stove, a limber pole extended six feet into the room. From its end hung a straw rope looped around a basket. Here swung the baby. When the mother left the room, she gave the basket a push, and when she came back an hour later it was still swinging slowly, rocking the baby.

In the early days of collective farming, each kolkhoz had a druggist's apprentice. With the new amalgamated farm collectives, actual medical service is becoming available to farmers. The victrola is a proud possession; records are handled with great care.

The upstairs of my new home had two rooms: one was the sacred bedroom of Akim and his wife. Though the sleeping room was not as warm as the shelf over the stove, they were very proud of it.

Across from the bedroom was a storeroom with no door, but a curtain hung across the doorway. Hanging from the rafters were strings of dried onions and mushrooms. In the storeroom were the treasures of the family; in the place of honor was a beautifully decorated trunk. Almost every farm family has such a trunk. In it, a kopek or two is dropped every time there is anything left over from the wages. These are thrown in the trunk in a special way, so they cannot be easily found. The wife "saves the kopeks by losing them." Guests are taken to the trunk on special occasions and the kopeks revealed, "hiding" among the contents.

Field Workers in Kazakh, an Asiatic republic, are entertained at lunch by a troupe of traveling musicians and dancers. Collective farmers near major cities sometimes get these shows at harvest times. Workers and entertainers show their Mongol blood.

Raising Crop Yields is Agriculture's Main Task *by G. M. Malenkov**

In the third year after the war, the prewar level of grain production was restored, and in subsequent years it increased. In the current year, 1952, the total cereal harvest amounted to 8 billion pounds, with the total harvest of the most important food crop, wheat, 48 per cent bigger than in 1940.

Much attention has been paid in the postwar years to equipping agriculture with new machinery. Our machine and tractor stations have been supplied with large numbers of new, improved crawler tractors with diesel engines, self-propelled harvester combines, cotton picking and other highly efficient machines. All in all, 1,546 new machines and tractors, forest planting, land improvement and animal husbandry machine stations have been established during this period, bringing the total number of such stations up to 8,939 at present.

The state farms have developed and considerably consolidated in postwar years: they have increased their area under crops as compared with the prewar period, enlarged the herds of productive cattle and augmented the output of farm produce. There are, however, serious shortcomings in the work of the state farms. One of the major shortcomings of many of them is the high production cost of grain, meat, milk and other produce.

What are the mistakes and shortcomings in the guidance of agriculture, and what are the tasks in this connection?

First of all, it must be said that some of our leading workers were guilty of a wrong, narrow, utilitarian approach to questions of collective farm development. They proposed the post-haste, mass resettlement of villages to form big collective farm towns, the scrapping of all the old farm buildings and the farmers' homes, and the setting up of big "collective farm settlements," "collective farm towns," "agro-cities" on new sites, regarding this as the most important task in the organizational and economic strengthening of the collective farms. The error these comrades made is that they had forgotten the principal production tasks facing the collective farms and had put to the forefront derivatives of these tasks, narrow utilitarian tasks, problems of amenities on the collective farms.

It must further be admitted that there are still instances of collective farm property being squandered. Certain workers in the Party, instead of guarding the interests of the collective farm's common enterprise, themselves engage in pilfering collective farm property. These workers take advantage of their official position to occupy collective farm land, make collective farm boards and chairmen supply them with grain, meat, milk and other commodities free of charge or at a low price, exchange their own low-productive stock for high-productive and more valuable cattle belonging to the collective farms, and so on. All these anti-collective-farm, anti-state actions inflict serious harm on the collective farm peasantry, impede the further organizational and economic consolidation of the collective farms and undermine the prestige of the Party and the Soviet state. It is necessary resolutely to punish as enemies of the collective farm system persons guilty of pilfering collective farm property with all the severity of the laws of the socialist state.

On many collective farms there are no permanently composed production brigades; means of production are not assigned to particular brigades and this leads to the elimination of personal responsibility; much working time is wasted because of faulty administration, which leads to a falling behind in farm work. Party, Soviet and agricultural bodies must exert themselves to improve the organization of labor on collective farms.

A more progressive system of distributing incomes should be introduced on the collective farms, under which the collective farm's income is distributed among its members in accordance with the number of workday units credited to the collective farmer, depending directly on the actual amount of farm produce obtained by the brigade, team or individual collective farmer. This will considerably increase the collective farmers' labor productivity, completely eliminate leveling in payment, and further enhance the value of the workday unit.

Finally, mention must be made of the existence of substantial drawbacks in introducing the achievements of science in farming. Anti-scientific and reactionary ideas have been exposed and defeated in agricultural science, which is now developing on the only correct basis, a materialist, Michurin basis, equipping our workers in their efforts to advance agriculture. But notwithstanding the achievements scored agricultural science still lags behind the needs of collective farm and state farm production.

Comrades, we all rejoice at the colossal growth of our socialist agriculture. Our field and stock farming is now on a new powerful upgrade. There is no doubt that within the next several years we shall have an abundance of foodstuffs in the country for the people.

* *Premier of the Soviet Union. From a report given at the 19th Congress of the Communist Party of the Soviet Union, October, 1952.*

In the trunk there may be a letter written by a learned grandfather; a picture of an uncle in elaborate Tsarist uniform; an embroidered towel the mother is making for the daughter when she is married; or a pipe inlaid with brass which belonged to great grandfather. Sometimes if there is a spell of good times, the kopeks will amount to fifty rubles, which the daughter will get as part of her wedding gifts.

The next morning, like farmers do everywhere, we got up with the sun. We assembled in the kolkhoz yard and the Predsediatel gave each brigade leader his job for the day. The Predsediatel was shaven and dressed in clean clothes. Akim's son whispered to me, "He does not insult himself." My brigade leader, one of the ten on our collective, was waiting for me. "You look like a good worker," he said. "Do what you are told and you will be happy." He waved an arm across the level 15-acre field of stubble. I will plow and you will walk beside me. In that way you will learn what is one workday credit in ploughing. The frosty soil was thick, heavy and black, and the month was November. Winter wheat would be seeded if the freeze did not come that night. A half dozen times during the day the brigade leader gave me the plow to handle and he walked beside me. I felt like a man and I was proud.

In our brigade were twenty workers; seventeen were women.

When a brigade is working together and not on piece work, the pace of work is set by the slowest, for a fast worker is unpopular, and when the brigadier is not looking someone raps his ankle with a hoe and warns him to slow down.

Akim Akimovich, the farmer who lodged me, like other muzjiks, or peasants, in our collective, was allowed the use of about a half acre, and he could own, if he could earn the extra money to buy them, one cow and a calf, a sow and ten pigs, several sheep, ten hives of bees, and as much poultry as he could get feed for. He could trade the produce from his half acre, his *sodok*, with his neighbors or sell it on the free market. But no one owned all the things they were permitted to own, for on one half acre who could raise the feed for so much livestock plus the potatoes and carrots and beets needed by the household? Akim worked his own land before sun-up and after sun-down and we all helped him.

One day, the Party Secretary of the *raion*, or county, in which Voronye was located, inspected our collective. He cursed at the thriftiness of the half-acre plots behind each muzjik house after he compared their appearance to a kolkhoz wheat field which had been sown a month be-

(*Continued on page* 125)

Wheat Roots Tell a Story

In the midst of all the horn-tooting from the nitrogen bandwagon these days, the farmer can't be blamed if he begins to get the impression that only one element is necessary to grow a crop. A look at Pat Johnson's wheat root experiments out in southern Illinois makes one realize, though, that vigorous plant growth still depends upon the proper balance of a number of nutrients. And winter killing in wheat, we are finding out, is more often caused by starvation than by the severity of the weather.

Johnson is Professor of Soils at the University of Illinois: but it's a rare occasion when he's seen on the campus. He's a research man working at the grass roots: he spends most of his time on the Brownstown, Oblong and Toledo experiment farms in the southern part of the state. Like all wheat growers he has been puzzled at the uneven stands and ragged conditions of many of his plots and fields each spring. And, experimenter that he is, he has taken steps to find the cause of the trouble. He had a suspicion that the real cause lay much deeper than was apparent and his suspicions seem to have been confirmed. Wheat roots dug from the experiment fields tell a factual story that is merely hinted at by the leaves and stems of the plants.

The Oblong and Toledo fields have been in experimental use for 40 years, better than 10 rotations. They have had various combinations of treatments including limestone, phosphate, potash, manures, crop residues and supplementary nitrogen. The Brownstown field has been under experimental management only through three rotations during which time it has had similar treatment. The soils in these fields are a gray silt loam over tight clay subsoils, rather typical of the land that grows much of the soft red winter wheat. They require three to five tons of limestone to insure good alfalfa and clover growth: they are low in native organic growth; nitrogen release is slow and often inadequate for corn and wheat; and the available phosphorous and potassium are both low. Physically, the impervious subsoils often cause an accumulation of water in the root zones during winter and early spring. Liming and the growing of deep-rooted legumes can do much to improve the drainage, aeration and moisture-holding capacities of such soils.

It Was Cold Outside

In the fall of 1951 wheat was sowed on untreated check plots and plots that received the combinations of treatments indicated in the table on page 92. Some received the full application of lime, nitrogen, phosphate and potash; others were given only one of these nutrients while still others were fitted with combinations of two or three of them. A hard freeze came along in November. Wheat on the potash-deficient plots immediately showed signs of considerable top injury, the leaves wilting slightly and turning yellowish or brown at tips and margins.

The plants on the plots lacking in phosphorous, even those plots to which lime, nitrogen and potash had been supplied abundantly, were stunted and their leaves took on a purplish tint. The stunting continued as the winter progressed.

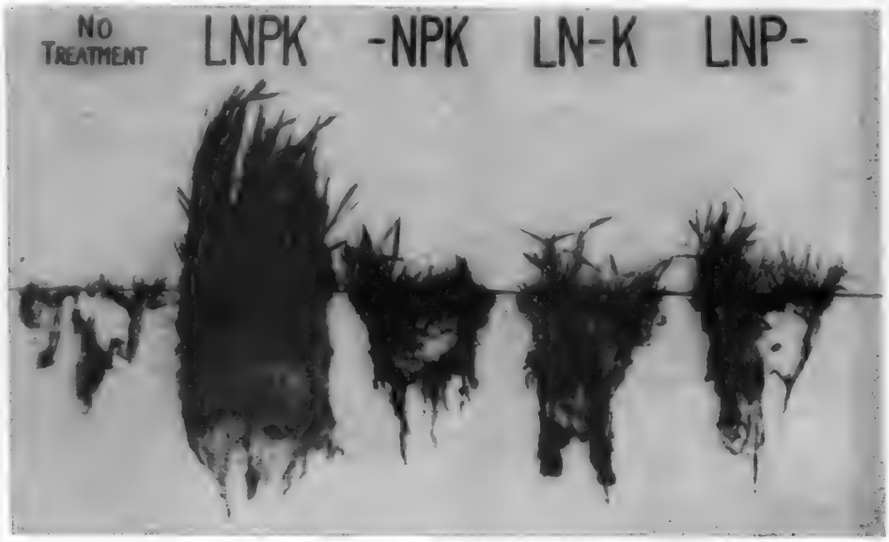
Despite the presence of nitrogen, phosphate and potash, the wheat on the unlimed plots took on an undernourished appearance after the freeze and became worse throughout the winter.

Southern Illinois experienced a cold December in '51 and the fields were blanketed with heavy snows. In January the weather moderated a bit and the wheat revived, but by the first of February the stands were in bad shape. Those on the lime-phosphate-potash plots had a more healthy appearance than the rest but even with these there was evidence of winter-killing.

On April 8, Johnson dug up a batch of roots and found there were wide variations between plants so far as total root growth, depth of active roots and color were concerned. "The strongest, healthiest specimens were from the plots that had received applications of lime, phosphate and potash," Johnson says. "Roots from the plots that were lacking in either phosphate or potash were less numerous and many seemed to have been winter-killed. The samples from the low phosphate plots were somewhat darker in color than those from the low potash plots. It was also apparent that many plants that lost their original root systems had reestablished themselves by this date by growing new spring roots. These were about three inches long."

Later in the month and again at the end of May more roots were subjected to examination. At the late April digging, the differences in the roots due to deficiencies of limestone, phosphorus or potassium were quite striking. All were stunted in growth. Those without potash were somewhat lighter in color than those without lime or phosphate. Plants that had received the complete treatment of lime, phosphate, nitrogen and potash were much healthier and their roots much more developed than those grown in plots in which one of these nutrients was lacking.

(*Continued on page* 91)



WHEAT ROOTS dug at the Brownstown, Ill. Experiment Field in late April, 1952. The plot that had received the complete treatment of lime, nitrogen, phosphate, and potash developed a vigorous root system and went on to yield 30.1 bu. per acre. The check plot with no treatment was an absolute failure. The other three yielded from 6.7 to 14.2 bu. per acre.

THRESHING TIME'S a happy time when yields are big. Current experiments are proving that it takes more than one nutrient to produce a big crop. Even improved wheat varieties can do their best only on soils that offer a balanced ration.

Feeding for an Extra 1000 Pounds of Milk

When Frank Trotter bought a young Jersey bull from the Brigham Farm in Vermont, E. S. Brigham and his herdsman Cesaire LaCoste gave him a bonus. In addition to a bull which should raise his herd average from the present 7,000 pounds of milk, LaCoste told him in his pleasant French-Canadian accent, "If you will follow our feeding program, you should be able to boost up your milk production by a thousand pounds per cow a year."

"I believe them," Trotter says with conviction, "in fact, I think that it's a conservative estimate of what their feeding will do. And I'm going to follow it.

"Look what they've done!" Trotter, who grass-farms 80 acres and milks 33 cows near Orleans, Indiana, will tell you with enthusiasm. "The national average production is 5300 pounds per cow—for all breeds. The national average for butterfat is around 200 pounds. But here's a man with a milking string of 125 Jersey cows with a 1952 average of 10,641 pounds of milk and 574 pounds of fat and a 12-year record of 10,407 pounds of milk and 552 of fat! And that record is made on twice a day milking, in ordinary stanchions, up in Vermont where they

ELBERT S. BRIGHAM and Cesaire LaCoste listen to Professor S. M. Salisbury as he rates one of the cows "Excellent." The world-champion Jersey producers (left) knee-deep in June pasture.

The Brigham Farm feeding schedule can be used on any farm. Here's how an Indiana dairyman is using it to boost production.

By Janice Turner and Grant Cannon

have only five or six months of pasture. But when they do have pasture it is tops and they can fill a whole field full of cows that have produced over 100,000 pounds of milk."

Both Elbert Brigham and the herdsman, Cesaire LaCoste, who has been with him for more than a score of years, have strong and very different personalities which have worked wonderfully well together to produce this herd which is one of the greatest in the world. Brigham is 75 years old, tall, erect, with the sharp, dry, directness that only generations of New England can produce—a successful Yankee. His personality is serious, his views are conservative, his politics Republican. Across his still spare waist hangs a Phi Beta Kappa key from Middlebury College. His approach to dairying is intellectual and scientific.

LaCoste, on the other hand, is a man of intuition and feeling. In the barn where he and the men under him speak mainly in French, he converses with the cows in his own mixed language, *"Mangez les* girls," he will say as he puts their feed before them. *"Bonne veille,* girl," he says softly as he strokes the back of the old Quomage cow. Or he may speak sharply, *"Tiens-toi tranquille,"* to a cow who is misbehaving. Between him and his cows there is a rare kind of rapport: if one is puny they agonize together until she is better, if one is nervous he knows it and removes the cause. But it's a different story if she is like the one Frank Trotter saw as he walked through the barns with LaCoste. This one, an elderly Ton of Gold cow—a cow which has produced 2000 pounds of butterfat in four successive years—had a good-sized knot on her tail. Trotter felt of it and asked LaCoste why he didn't have it removed. LaCoste shrugged. "If it doesn't bother her, and it doesn't bother me, why should it bother you?"

These are the men who threw in—for free—their feeding program when Trotter visited the farm. "If I could feed my cows like this, and I mean to some day," Trotter says, "I *know* they'd give another thousand pounds." Here is the winter schedule as Trotter carefully copied it in his note book:

6:30 a. m.—when the milking is almost done, the mangers are swept clean and 10 pounds of corn or grass silage is fed with one-third of the day's grain ration on top of the silage. The grain is fed at the ratio of one pound of grain to three of milk produced. The cows must clean up their food quickly. At the Brigham farm a broom is one of the most used tools in feeding. When the cows have eaten to the point where some of them are standing with their heads stretched out and cocked to one side, their black tongues looping out to scoop in the last of the silage and grain within reach, the men walk through the barn with their brooms sweeping the feed away from the slow eaters to their hungrier neighbors. "We don't want to leave food in front of them for too long," LaCoste says, "it will destroy their appetite."

8:30 a. m.—dry timothy and clover hay is fed and the cows are curried.

10:00 a. m.—the cows go outdoors for an hour and the men sweep down the two big barns and sprinkle 100 pounds of superphosphate on the floor.

11:00 a. m.—10 pounds of corn silage and the next third of the grain ration are fed. "Now for a while the cows must be quiet and make milk," LaCoste says.

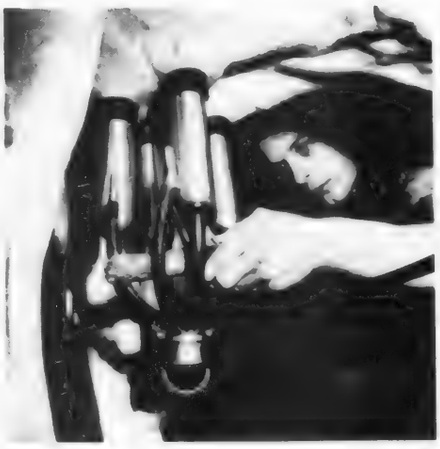
5:30 p. m.—with night milking well along, the mangers are swept clean and 20 pounds or more of grass silage is fed with the last third of the grain on top followed by about five pounds of alfalfa hay.

The basis for this feeding program at Brigham Farm can be stated quite simply, *space in a cow's digestive apparatus is too valuable to be occupied by anything but the best of roughage and grain.*

Of course, that idea is not exactly new. Every dairyman worth his salt knows it, just as he knows the time-tested breeding and management practices used at Brigham farm. The catch is that at Brigham farm these good practices are followed religiously. A short time ago in a round-table discussion several leading dairymen from all over the country were asked this question, "How is the grain mixture changed when you have poor quality hay?" Several ideas were discussed such as raising the protein percentage. Brigham's reply was classic, "We do not feed poor hay."

He might have added that the ensilage, pasture, and grain which the cows eat is not poor quality either. Year after year the very best roughage and grain have been produced and bought to make the

"CESAIRE LOVES QUOMAGE" might be carved on the barn door. Cesaire LaCoste, the Brigham Farm herdsman, believes that there is no cow more beautiful than the world champion Living Lifetime Producer shown here to the left.



ATTENTION TO DETAIL PAYS off at the Brigham Farm. The cow shown at left lets her milk down better if there is a weight on the milker. Every cow is combed and brushed each morning.

most of the precious space in the cow's stomachs. A Lincolnesque Yankee, Philip Spooner, is in charge of crop production and is responsible for their fine quality.

Hay

The Canadian border is only 14 miles from Brigham Farm and the winters are long and tough. Alfalfa has a hard time surviving. Usually it freezes out in two winters, though Brigham proudly showed Trotter a good stand of Ranger alfalfa that was five seasons old. Some of this damage has been alleviated at Brigham's by tiling, annual fertilizing with 500 pounds of 5-10-10, and heavy seeding. Even so there are years when spring will make a false start—the mild air and sparkling sunshine will trick the legumes into waking up and starting their growth—and then freezing, killing weather will set in again. When that happens, Brigham is ready with a top dressing of 150 pounds of ammonium nitrate to give the nitrogen the legumes would have provided.

To give alfalfa the best possible chance, it is seeded at the rate of three pounds to the acre to which Philip Spooner, the crop production man, adds five pounds of brome grass, four pounds timothy, four pounds red clover and a pound of ladino. A few fields meant only for hay are seeded with eight pounds of alfalfa and six pounds of brome. LaCoste is not enthusiastic about brome as a hay crop, however, considering it too coarse by the time it can be cut in the unfavorable June weather. He prefers timothy, which grows easily and well in Vermont. The trouble with timothy is that it doesn't yield as much.

The climate usually works out a choice of two kinds of hay, the fields which were recently seeded to the shotgun mixture produce alfalfa-clover-brome, and the fields seeded more than two years yield clover-brome-timothy.

The 500 tons of hay put up every year at Brigham Farm are divided now into two cuttings, but Brigham is thinking of taking a leaf from the European book on hay—taking hay crops off earlier and more often. Whenever the farm has European visitors, he says, they comment on the coarse, stemmy quality of the hay, explaining that back home they cut their hay fields repeatedly. Now that Brigham Farm has four new hay-driers, its owner feels he may try the same thing.

In pre-drier years, putting up first-cutting hay was something. Underneath that heavy soil is a hardpan subsoil, and without the tiling (which Brigham believes pays at least 6 per cent a year) the ground in many places would support a colony of frogs. Humidity is high in a New England June, and even if a streak of rainless weather comes along, curing is a lengthy affair. Almost always Spooner had to resort to the old down-East custom of cocks and caps (hay forked into small stacks and covered with heavy cloth)—probably the world's most expensive system of putting up hay.

FEEDING WITH A BROOM (below) is a Vermont trick; if the cow doesn't work at her eating, her food is swept toward her hungry neighbor. Frank Trotter, of Indiana (right), is following the Brigham system of feeding two kinds of hay daily to his herd.

MANURE IS MONEY and is banked at Brigham Farm. Each gutter has a trap door in it through which the manure is dropped into the manure cellar below. Here it is held without leaching until it is time to put it on the land.

The driers, four of which were built for $2000 by the regular hands at what Brigham calls "a good knitting job," are rapidly paying for themselves. They must dry hay put up in bales—baling is necessary because of the scattered barn space—and they do it successfully, drying bales stacked up to five deep and containing as much as 40 per cent moisture. A mobile oil heater with a capacity of 750,000 BTU's an hour supplements the fans.

Ensilage

"The cows eat that silage just like you would eat up ice cream," LaCoste told Trotter as they watched a cream-colored

Jersey tucking it away. They have seven silos that are filled each year with 900 tons of grass silage and two large silos that hold 400 tons of corn silage which LaCoste claims haven't been completely empty in ten years.

This great feeling for silage came as a blow to Trotter who owns a silo but hasn't filled it for two years. He has pointed out to critics that since he quit feeding silage his cows have gained 1000 pounds in milk production. When pressed, however, he will admit that during these same two years he has conducted an extensive culling program and has been feeding better quality hay than he used to. After seeing how Brigham Farm feeds silage, he has drained the rain water out of his silo and plans to fill it with grass silage this summer.

Brigham Farm puts up two kinds of hay, two kinds of grass silage, and corn silage because a cow must eat a vast amount of roughage to produce an average of 36-plus pounds of milk every day and they intend to provide a tempting variety for her. "The cow is just like people," Cesaire LaCoste explains, "It takes some variety to keep her eating good

so we try to feed her two kinds of hay and two kinds of silage every day"

There are other reasons for both corn and grass silage. Corn silage helps keep the cow's weight up and is fine for supplementary feeding in late summer, grass silage has a desirable laxative tendency. "Comparing grass with corn," Brigham says, "we consider them of equal feeding value."

Twenty-five acres of corn, harvested with a field chopper as soon as the ears are dented, supplies the silage. The following spring the corn ground is seeded to oats and the standard grass mixture. Oat yields average 60-80 bushels per acre and a couple of times have reached the 100 bushel mark.

Grass silage for the milking herd is put up with around 200 pounds of beet pulp to the ton as a preservative as well as a production booster. The exact amount of preservative depends somewhat on the moisture content of the grass when it is blown into the silo; the rule being the more moisture, the more preservative. Corn meal, hominy, ground oats and wheat have also been used as a preservative with some success, but the no-preservative method has been tried and given up because of the possibility of objectionable odors in the milk. Brigham, by the way, retails his own milk in St. Albans. The 5.4 per cent creamline is left intact, and for every one of the 300 regular customers, there is another who wants to be on the list.

It is typical of this New England farm, where extravagance is looked on with about as much enthusiasm as is sorghum syrup or oleomargerine, that a nourishing but less expensive silage is put up for the growing heifers. For them—and all over six months get silage—the beet pulp is omitted and a less expensive preservative, molasses, is added at around 50 pounds to the ton.

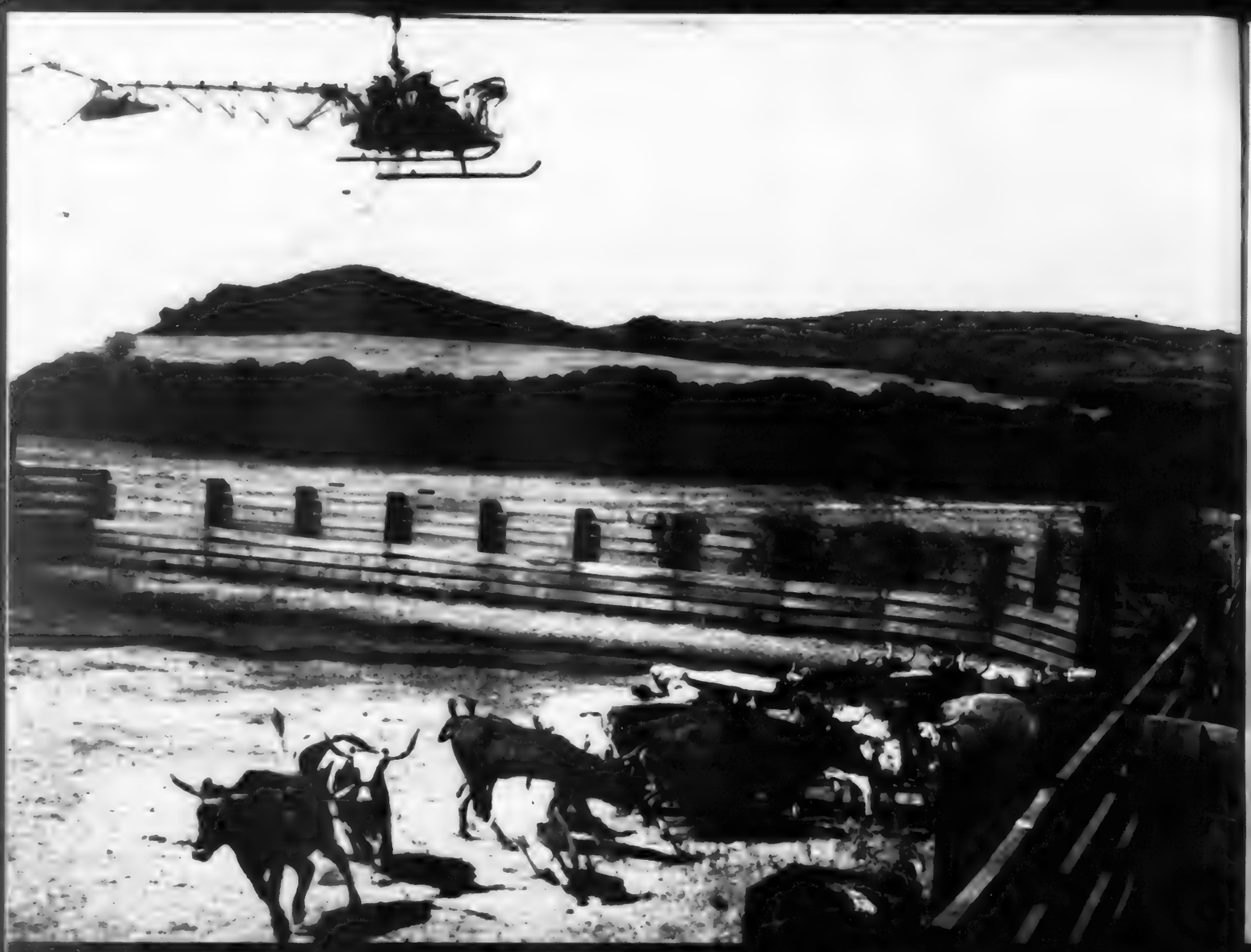
Pasture

"In New Zealand there is a dairyman with a herd average of more than 500 pounds of fat, produced without a pound of grain," Brigham told Trotter. "Another dairyman there believes in pasture rotation with such fervor that he has devised a fence which moves automatically, timed with a clock. We are not quite as strong on pasture as they are, perhaps, but we *do* believe that the success of a farm goes back to the soil and the pasture you can raise on it."

Because of the soil fertility, the cows go out on grass earlier than one might expect. The first of May—only 10 days behind Trotter's southern Indiana herd, but two to three weeks earlier than Brigham's Vermont neighbors who do not fertilize their pastures—is the average date. Immediately, the daily average production goes up five pounds per cow. "And if your cows don't do as well," Cesaire LaCoste told Trotter, "then they're no good or your pasture is no good." Trotter went home, looked at his records, and was not sure whether to be relieved or ashamed—his cows had increased production 4.9 pounds when he put them on

(*Continued on page* 105)

CALF FEEDING AT TROTTERS (below) and at the Brigham Farm (left) calls for milk, ¼ whole and ¾ skim, then home-grown grains mixed with powdered milk or a calf starter.



Screw Worms...

The calf darted in and out through the mesquite trees as though a demon were after it. There was a hiss of rope through the air and it somersaulted suddenly and smacked the ground, its hind feet stretched out behind and held tightly by a rope. After the catch the bay horse backed away, keeping the rope taut as the rider swung from the saddle and "walked" the rope to the calf. Then the calf was forced to the ground by the rider and held with a knee on its neck.

"He thought the Devil himself was on his tail," the cowboy who made the catch said with a grin as his *compadre* reined in by him.

"So does his mammy," answered the second rider nodding toward a big Hereford-type cow jogging through the brush, head high, bawling to her calf. She stopped abruptly as two leopard-spotted cow dogs rushed out to bark her away. She continued circling frantically at a distance, lowering her horns to make a swipe at the dogs when they came too close to suit her.

"He's wormy all right," the roper said with a glance at the calf's naval. "A pretty bad case. Loan me your medicine, Red. I used mine up back aways."

He knocked a few white larvae from the surface of the wound, ground them into the red sand with a stick, uncorked the bottle and poured a smear over the wound, working it in the pocket made by the maggots and around the edges of the wound with a small brush. Then he slipped the rope off. The calf lay motionless for an instant not realizing it was free, then struggled up and ran crazily back to the cow—twisting its body, shaking its head in resentment at the whole treatment.

Lucky calf to be found, though, these cowboys know, because too often what the screw-worms start the buzzards finish.

Screw-worms are not new to the Southwest. Like the cattle business itself, they started out little and wound up big. When the Spanish *conquistadores* rode into the region they undoubtedly found these flies that raise their young in living flesh in the wild life. In the days of the open range when the great cattle empires were in the making, the cry for a "hot iron" ran from the Rio Grande beyond the Red River as the pioneer cattlemen marked ownership with the fire-brand. Every time the iron bit into the flank of a steer the screw-worm population was given a shot in the arm. Later the network of barb-wire fencing that criss-crossed the ranges offered still another kind of wound which boosted fly numbers.

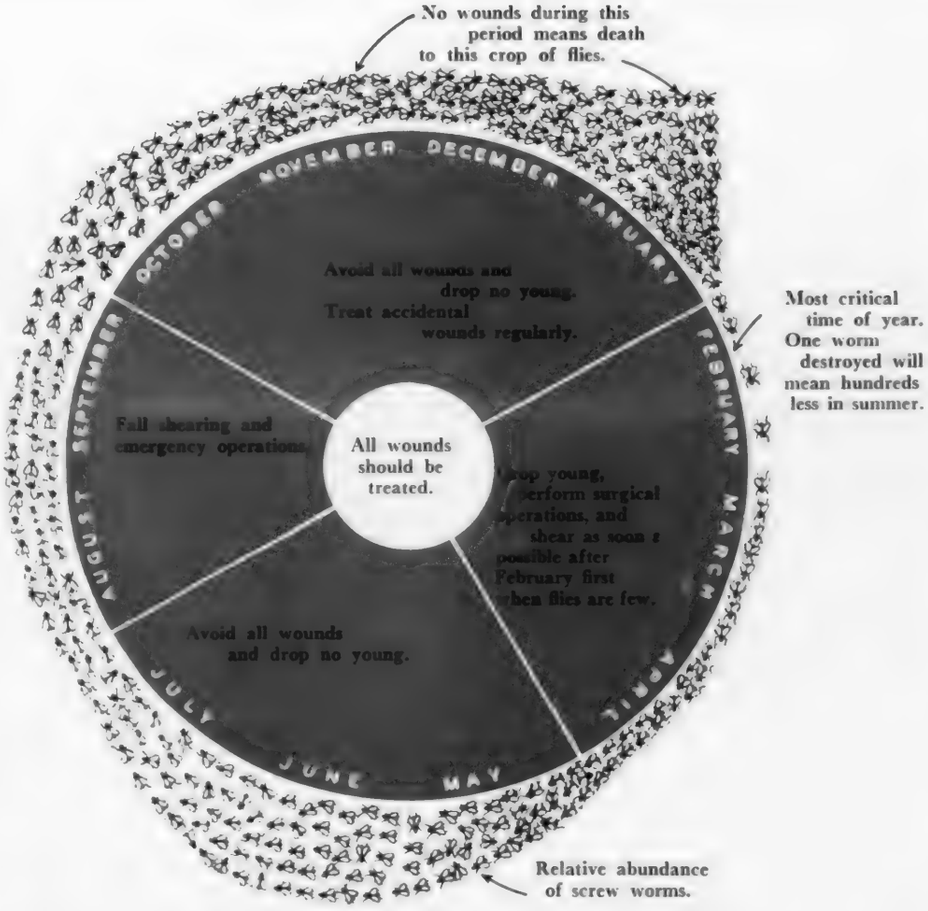
By Joann Bell Pierce

Until 1933 when infestations broke out in Georgia, the screw-worm was unknown to the southeastern states, but it took just two years for it to spread throughout Florida and produce heavy losses. Today along the Gulf coast and across Texas to California it has reached such proportions that it takes first rank among pests with which stockmen have to contend, causing an average loss of 25 million dollars in livestock and labor annually. In the Southwest, where it hits the hardest, ranchers report that 85 per cent of their annual losses are caused by the screw-worm.

Since all the screw-worm needs to get a start is a break in the skin, the present system of livestock production in infested areas and the topography of the country give it a helping hand. Wounds made by marking, branding, castrating, shearing, dehorning and docking all afford fertile breeding grounds for the fly. Even the smallest wound made by the Gulf Coast tick or another of the biting and blood-sucking pests is invaded by screw-worms. During the screw-worm season, new-born animals, unless doctored *pronto,* almost invariably wind up with infestations of the navel.

The mesquite and catclaw thickets which cover much of the Southwest, the black brush, cactus and needlegrass, all cause many a scratch and snag which gives the screw-worm a foothold.

The screw-worm has weather and climate in its favor. It is not a true native of temperate America, but lives the year


No wounds during this period means death to this crop of flies.
NOVEMBER
DECEMBER
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
Avoid all wounds and drop no young. Treat accidental wounds regularly.
Most critical time of year. One worm destroyed will mean hundreds less in summer.
Fall shearing and emergency operations.
All wounds should be treated.
Drop young, perform surgical operations, and shear as soon as possible after February first when flies are few.
Avoid all wounds and drop no young.
Relative abundance of screw worms.

SPRAYING CATTLE to control flies is handled quickly by a custom heliocopter sprayer at the Wichita Mountain Wild Life Refuge, Cache, Okla. The chart above shows the seasonal abundance of screw-worm flies and their relation to recommended ranch management in southern and border states.

around in the mild regions of Mexico, through South America and, in the United States, only in areas along the Mexican border and in Florida. In milder winters the flies may survive farther north in these areas, but in severe winters, like many a jaded businessman, they seek the sun. Whatever the season, though, they never take a vacation from the task of reproduction, but infest any wound available.

With spring they start north again at the rate of about 35 miles a week under their own wing power. Those that overwinter in the Southwest rarely get beyond Missouri and those which spend the winter in Florida seldom migrate beyond South Carolina. Farther north than that, they are strictly visiting firemen, usually hitch-hiking to the area in a shipment of infested livestock coming up from the South or Southwest. In this way, they have

(*Continued on page* 114)

THE SCREW-WORM FLY has been doing business in the South and Southwest for years. Any wound, such as the barb-wire cut on the goat, may become a breeding ground for the parasite. The screw-worms, magnified above, are covered with rows of spines which give them a screw-like appearance.

Working Buildings

By William Yaw

While Harry Offut, Jr., and I were talking about his Rolling Acres farm, he stopped in the middle of a sentence, hunched up his heavy shoulders, and said: "Bill, these beef prices are too high. We need to mass-produce beef at a lower cost per pound in the years ahead. One of the things that would help us do it is buildings that would pay their way and save us some labor at the same time."

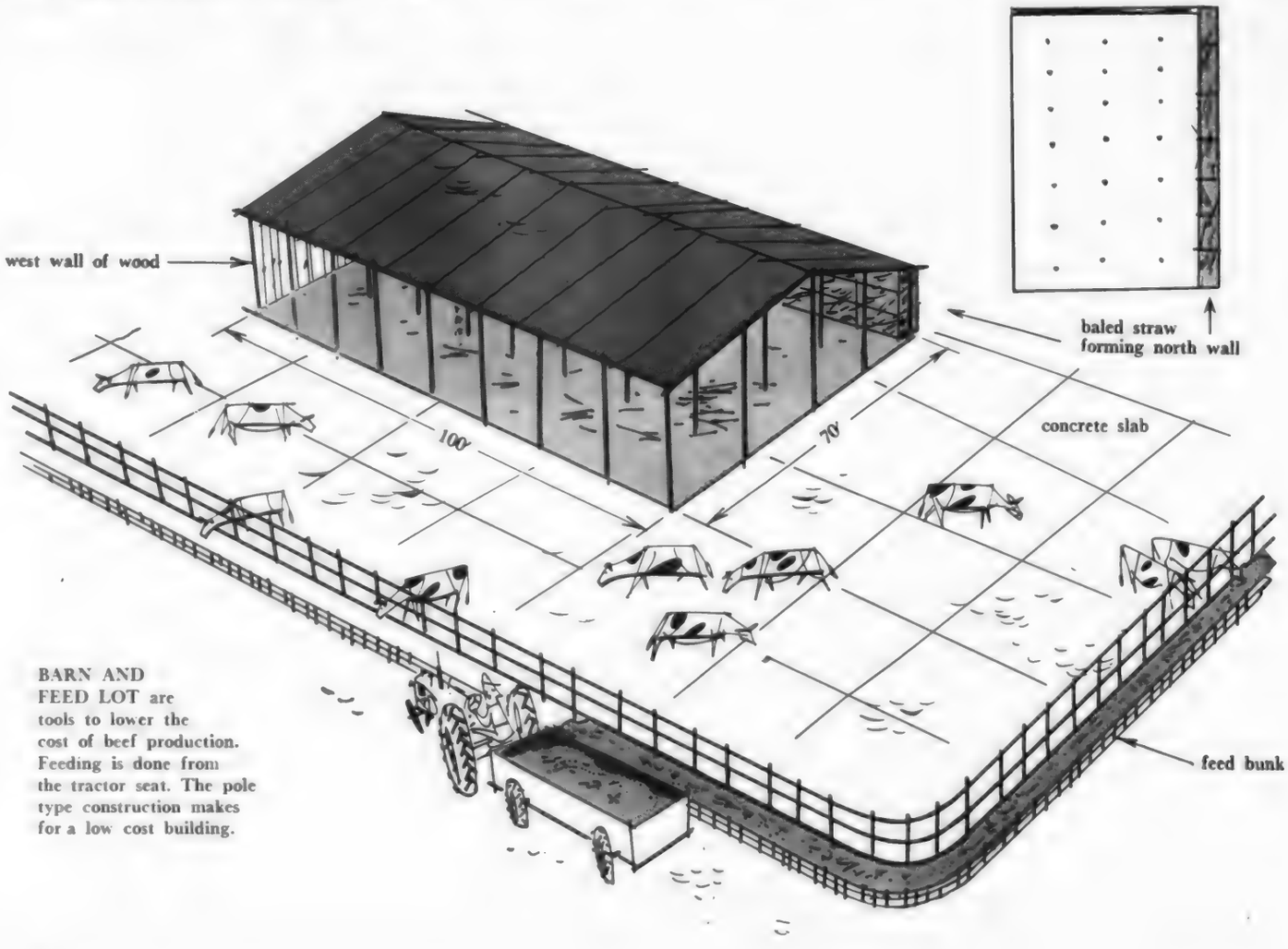
Offut is not one to talk just to hear the rumble of his baritone voice. He talked, figured, planned and came up with some rough sketches of buildings which would do the job he needed done on his 800-acre Indiana corn and grass farm. And he subjected those plans to the vigorous attack that only a man who is about to spend money on them could launch.

When he had finished his planning he had on paper a corn crib and a loose housing barn which would be cheap to build, do a good job of storing grain and of protecting beef calves, have a low maintenance cost, and save labor in handling corn and tending the cattle. These buildings were designed to fit the operations of a big farm that grows lots of corn and feeds out a lot of cattle on grass and corn silage and corn and cob meal, but the principles of economy and usability that went into their planning are tailored to fit any farm in the world. The plans didn't remain on paper long—both buildings are now up and being given the test of use.

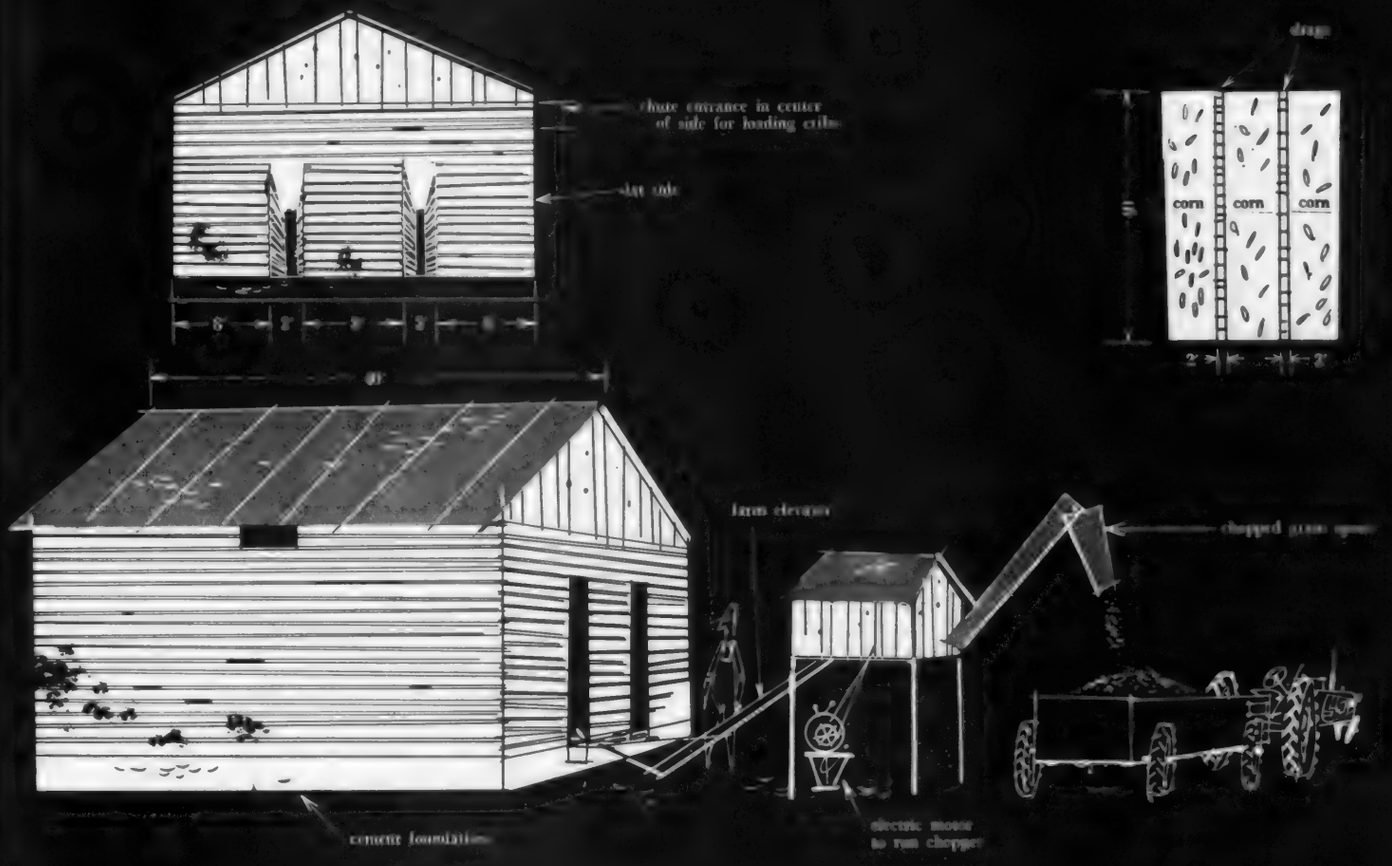
The Corn Crib

"What we want in a corn crib," Offut said when he was about ready to start building, "is an expandable-capacity storage building with no waste space which can be loaded or unloaded by one man with very little exercise of his shoveling muscles."

The crib was built out of rough, unfinished lumber by farm carpenters whose work has the same sturdy, rough-and-ready look to it as the lumber they used. The



BARN AND FEED LOT are tools to lower the cost of beef production. Feeding is done from the tractor seat. The pole type construction makes for a low cost building.



SAFE AND INEXPENSIVE corn storage, handling and feed preparation are accomplished with this crib and corn chopper. The crib is unloaded from the alleys with a chain drag. From the alleys, a farm elevator hoists the ear corn into a chopper which chips it into corn and cob meal and drops it into a self unloading wagon.

building is 28 feet wide and 40 feet long, with two narrow, two-foot alleys running down the length, dividing it into three bins. The bins are 8 feet wide by 18 feet high and 40 feet long. Over the unloading alleys the three bins merge into one. Each bin is self-unloading into one of the alleys through three doors along the side. The corn tumbles out onto the floor of the alley, where a chain drag powered by a one-half horse-power electric motor pulls it out. As the crib empties itself a small quantity is left in the corners which takes a little scooping to clean out.

A Davis corn chopper is located directly in front of the crib. As the corn is pulled out of the alley by the drag it is dumped into a farm elevator, in this case a Belt Harvest Handler, which lifts the corn up to the chopper which is about six feet above ground. The chopped corn and cob meal flows from the chopper into the bed of a wagon to be hauled away. The drag can be moved from one alley to the next and the corn chopper is located so that the elevator will deliver corn to it from either of the alleys.

"Normally one man turns three switches and regulates the flow of corn into the chopper and the job is done," Offut said. "Think of the difference between this and the old way we handled corn. We used to unload the crib by hand into the wagon; then we'd haul it over to the barn and unload it into the hammer mill after spending a half hour lining up the tractor so that it didn't throw a belt. Finally we'd get our feed ground and haul it out and feed it. We wasted a lot of labor that way and that's one thing we don't have to squander. It was one point in shooting up our costs of raising beef.

"The crib isn't perfect," Offut continued, "and if I had to do it over again I'd make some changes. You notice I said that *normally* unloading the crib was a one-man job? This year, however, we had wet corn and it doesn't fall out into the alleys as easily as it did when it was dry—which makes unloading a man-and-a-half job. One man to turn switches and regulate flow and one to nudge the corn a little. If I were to build it again I'd have a dryer built into it.

"The basic idea behind the building would remain the same, and the changes in structure wouldn't be too drastic. Instead of three bins we would have one big one with no separations. We would put in two shallow gutters for the drag right where the alleys are now and the air tunnel would be built down the center of the crib. The unloading gutters would be about a foot deep and 16 inches wide and arranged so that they could be covered by removable planks. When we opened the crib we would pull out one or two of these planks to let the corn drop into the drag and gradually work back as the corn was removed.

"The air tunnel would be six feet wide and five feet high and would house a 48-inch fan. We would use the motor from the corn chopper to power the fan and could blow up about thirty thousand cubic feet of air a minute. Placed in the center of the crib we would have a 16-foot column of grain on each side and we would pile it up 18 feet high to allow for settling. The fan would be set back into the tunnel 16 feet so that we wouldn't have an undue loss of air from the front of the crib—the tunnel would have to be boarded around solid up to where the fan is situated for the same reason."

The Barn

To cut the cost of housing beef cattle a low-cost barn was designed to house two hundred head of cattle to give them protection from rain, sleet and snow and to make it possible for one man to mass feed and care for them. Offut took a page from D. Howard Doane, of St. Louis, when he planned his pole-type barn. The treated poles support the roof which covers an

area of 70 by 100 feet. At present the roof is tar-paper covered; later it will be covered with aluminum or steel roofing. The west side of this barn is boarded up with rough lumber. The north side of the barn is closed by two rows of baled straw which is protected from the steers pushing it over by a two-rail fence along the side of the building. The south and east are left open but may be partly closed with straw during severe weather. The dirt floor of the building is covered in the fall with corn cobs for bedding. As the winter progresses the outside row of baled straw which makes up the north wall is removed and scattered over the floor for additional bedding. As spring comes the remaining row of straw is used up and by the time warm weather arrives the wall is gone and the building has been converted into an open shed.

The feed lot is on the east and south sides of the building and has been paved with concrete heavily reinforced with old fencing. The trick of reinforcing the concrete with fencing has made it possible to build a serviceable slab that is not more than three inches thick. Around the perimeter of the slab is a two rail fence and a concrete and wood feed bunk. The lower of the two rails is set a comfortable distance above the bunk so that the steers can put their heads under the rail and into the feed.

Offut's feeding program calls for heavy feeding of grass and corn silage which is delivered into the bunk by a Helix self-unloading wagon. This wagon is also used for delivering silage to the field silos in the summer and chopped corn and cob meal from the corn crib when he is finishing the animals. The filling of the bunk with silage is a twice-daily operation that takes about 45 minutes.

The concrete slab and the open barn make it possible for a man to clean out the place with power equipment. A tractor can drive through the barn or maneuver around inside.

The cost of the barn was $4,000, the feeding floor $600, and the feed bunks $1,200. "The only way these figures have any meaning," Offut said, "is to relate them to the beef they help produce. I figure to depreciate the building over a period of twenty years, so I use a formula worked out by Dr. J. C. Wooley of the University of Missouri to get the total cost for this period. The cost of building, slab and bunk is $5,800. This will be depreciated, $1,740 for interest on the money for this period, $580 for maintenance and repairs, $348 for insurance, and $1,160 for taxes. This gives us a total cost of $9,628 for the 20 year period. During that time I figure it will house 200 head a year which will gain 500 pounds each to make a total of 2,000,000 pounds of beef for the period. Subtract a two per cent death loss from this and you have a net of 1,960,000 pounds of beef to divide into the building cost. The answer is a cost of four-tenths of a cent for building and lot for each pound of beef produced. I haven't figured how much labor we can save, but I'd be willing to bet it cuts our labor costs to a third of what we used raising beef in our old buildings."

THE UNLOADING ALLEY has a chain drag which pulls the corn out of the crib to the chopper. Dry corn falls out of the bin doors by itself; wet corn takes a bit of nudging—one more reason for a dryer to be installed.

A DOUBLE-CHUTE SILO with a built-in feed rack has reduced feeding time by more than half. Throwing silage down the two chutes helps distribute it. The upright pipes keep cows out of the rack—they are curved to keep water out.

Although this unit was designed for feeding cattle, it could easily be combined with an adequate milking parlor and used as a dairy lounging barn. It could also be adapted to feed sheep or hogs without too much change.

The Feeder Silo

Other farmers throughout the country are adapting old buildings and creating new ones to make farming an easier job. One of them, William Hasselman, whose 120 acre dairy farm is in DeKalb County, Indiana, up near the Michigan line, has built a silo that embodies the same kind of planning for efficiency. Around the base of the 12 by 40 foot silo is a three foot wide cement feed rack which can be filled from two drop chutes instead of one.

The silo is made of Rib Stone concrete blocks and cost $1700 for labor and material. The extra chute added $100 to the cost, but Hasselman believes that the labor saved in distributing the silage in the feed rack will pay him for the investment in two years. The unit, incidentally, has a sloping drain in the bottom which does away with the problem of making it a catch basin for the rain.

"Our cows sleep inside the barn and eat outside," Hasselman says, "and they keep cleaner and thrive on the cafeteria style feeding. We can feed 38 cows at a time without crowding and our feeding time is reduced by half. I throw silage down on each side of the silo, then spread it around the feed rack easily and quickly. Best of all, there's no feed carrying.

THE AUTHOR: William Yaw was born and raised on an Iowa farm. After graduating from Iowa State College and doing a stint in the army, he secured his Master's degree from Purdue, his thesis being on the labor involved in feed handling. After leaving Purdue, Yaw became an associate of the late C. M. Long in The Farm Clinic and, with his partner, Marshal Allman, has carried on the work of this organization since Mr. Long's death.

By George Laycock

All-Weather Lanes

In lane building it isn't the surface, but the road-bed that counts

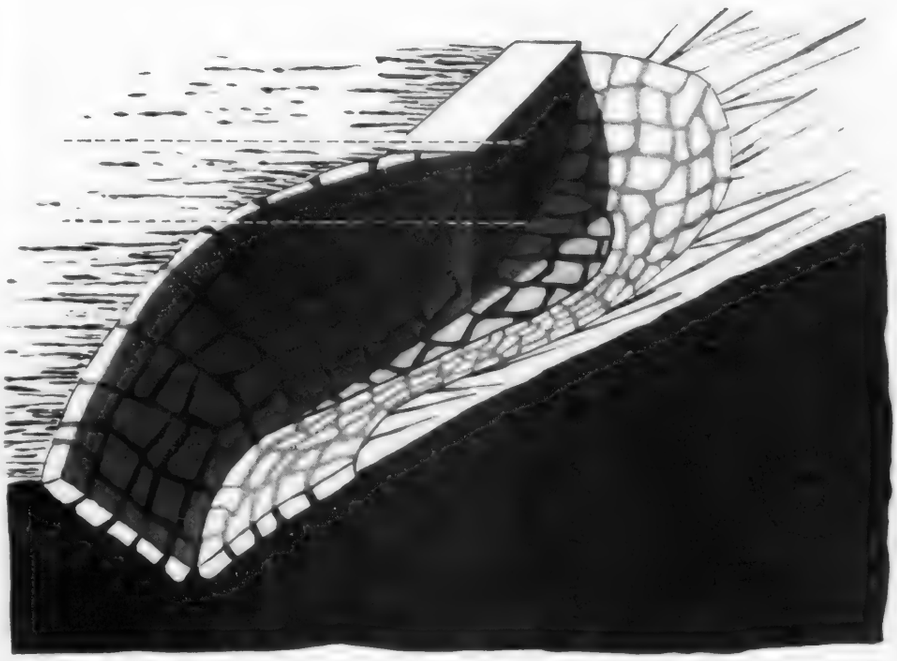
A farm lane is like a boat, if you don't keep it in shape you will be stuck on your island. Farm lanes are carrying more weight than they ever carried before. The lane of three decades ago was seldom asked to bear anything heavier than a two-ton load of hay. Today the same lane is pounded by tractors that weigh two tons and milk and livestock trucks that weigh six and eight tons. If the roadbed is badly built, a heavy truck can go through the surface crust of the lane as easily as an elephant goes through the twigs covering a pit trap—and the truck will be just as surely immobilized.

Rough lanes mean more wear and tear on these expensive vehicles and consequently most farmers think it's cheaper to repair the lane than repair the machinery. A few years ago Iowa State College made a study of car expenses paid by 293 rural mail carriers. It cost these mailmen 7.8 cents a mile to travel dirt roads and 4.5 cents a mile to travel gravel roads. But, though the surface does the damage, it is the roadbed below which makes a good or bad surface.

Farm lane problems fall into two classes: those that crop up when a new lane is built and those problems that are always with us in maintaining a lane.

A new house or feed barn usually calls for a new lane. Four years ago this was a problem that faced Jess Maddox on his farm at New Martinsville, Ohio. Maddox knew that a lane like a funny story, should be kept short, but there wasn't much he could do about the length of his lane. He needed a half mile of new lane to replace the mud that linked his house and the highway. And he wanted an all-season lane that would hold up under today's farm traffic. The lane he built has gone three years without needing additional care. It promises to need only periodic dragging and an occasional load of stone to provide a smooth, solid road indefinitely.

Back in 1949 when Maddox decided to build a lane he got into a huddle with Leo Fisher of the Fayette Limestone Company. Fisher had engineered the building of sev-



A PAVED INLET to a culvert is laid to prevent gouging and washing when a fast flowing sideditch must turn a corner to go under the road.

eral lanes around the community, with considerable success. He had adapted the road-building methods used by state highway engineers to the farm lane.

Maddox wasn't faced with the task of choosing a location for his new lane, but had he been, he would have given attention to such essentials as locateing it to save as much fencing as possible, not cutting fields up into small patches, and avoiding low wet spots that might cause road failure in rainy seasons.

Another important problem in planning a lane is the location of the entrance from the main highway. Drivers coming out of the lane should be able to see at least 350 feet in both directions, for that's the stopping distance required for a car traveling 50 miles an hour.

The grade at the entrance should be gentle, never more than five per cent slope, according to James W. Spencer, who has done a lot of work at Cornell University on farm lanes. Ditches with a five per cent slope need seeding as erosion protection. Fescue or perennial rye are good soil holders. Most soils will erode on a two per cent grade and silty soils often erode on a one per cent slope.

Maddox decided to make his lane eight feet wide, which will accommodate single-lane farm traffic. On sharp curves the road has to be wider to give turning space. With these general decisions made, Maddox, with Fisher's help, started construction. Here are the steps he followed:

1. Establish good drainage. "If your lane isn't well drained," says Fisher, "you are wasting money. You'll have spongy soft spots and your road will break up." He suggested that Maddox plow a single furrow on either side of the lane. Either one- or two-bottom plows can be used to throw these furrows toward the center of the road. These ditches will carry water away from the lane. Where open ditches flanking the lane would hamper farm operations, it's a good plan to lay drainage tile and back fill with a porous material such as sand or gravel.

Where water would normally cross the lane, culvert pipe should be installed to take water under the road instead. The two kinds of practical culvert pipe for farm use are steel and concrete. The concrete may be either plain or reinforced. The plain concrete tile will hold up under most farm traffic if covered with at least a foot of material. On a heavily traveled road, reinforced concrete is added protection and should be used especially where it is closer than one foot to the surface. Few places will need a culvert larger than a 12-inch diameter unless a small stream must be bridged. Then an iron culvert can be used and set in a stone or fill-type bridge. They come in 3, 4, 5 and 6 foot sizes. Straight concrete tile in this size sells for about 95 cents per foot in three-foot lengths. Reinforced, it costs about $1.50 a foot. Twelve-inch iron pipe sells at about $1.65 a foot and can be purchased in lengths that are multiples of two feet.

After the culvert is in place the space around it should be filled with fine material to distribute the weight on it and keep rocks from damaging it.

Inlets to culvert pipes can be trouble spots unless they're fixed properly in the beginning. Water flowing down a ditch along the road and suddenly turned into a culvert can eat away the edges of the road. The cure is often a paving of stone or concrete or both around the inlet.

Where water has to be carried from a ditch to another ditch or creek at a lower level you may need a catch basin. These are concrete boxes. The tops are built level with the bottom of the ditch and covered with an iron grating for the protection of stock. A drain pipe at a lower level in the catch basin carries water from the box.

For most situations the catch basin will be large enough if it measures four feet long on the inside, two feet wide and at least two and a half feet high. The concrete floor should be six inches thick and the walls eight inches.

2. Maddox spread a layer of screenings from a stone quarry between the furrows. Sand could have been used if screenings were unavailable. "This seal," says Fisher, "is one of the most important steps in building a lane. It keeps moisture from coming up and stone from going down." It should be spread an inch and a half to two inches thick. To level up dips in the road, cover the seal layer with a six- to eight-inch layer of stone up to four inches in size, spread another layer of screenings and layer these materials alternately until the roadbed is level." "Never fill a low spot with fill dirt," says Fisher. "It just won't hold up."

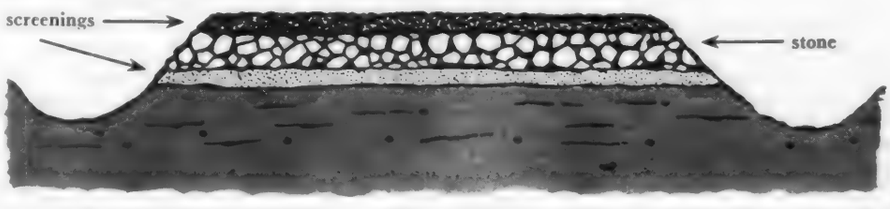
3. On the seal layer Fisher recommended that a six- to eight-inch layer of rock or gravel ranging in size from one and a half to four inches be spread.

4. Maddox dragged the large rock and leveled it up as much as he could. The angular edge of the crushed rock will lock it together. This is an advantage which uncrushed gravel doesn't offer. Large, uncrushed gravel with its rounded edges rolls off the road and out of the wheel tracks with each passing vehicle.

5. On the layer of large stuff Maddox spread another one and a half to two inch layer of screenings to sandwich the rocks between the fine material.

6. He finished the job by dragging the top layer to level it off. Rocks showed

A LANE IN PROFILE shows the layer of fine screenings applied first to seal off moisture, the layer of larger rock, and the layer of gravel or crushed stone to top it and seal the job. The fall from the center should be a half-inch to the foot; the plowed ditches on each side will carry away water.



THIS TANK WEIGHS 11,000 pounds when full of water for the stock. The steel wheels bite into the surface and the load will bog down on a muddy farm lane.

through after leveling, so the road got another two loads of screenings to give it a smooth surface. Traffic on this lane will compact the materials and bind them together and the tighter they're packed the fewer the air spaces in the road and the less water it can hold. It should be packed with a farm roller or loaded trucks.

A lane-building job shouldn't be started in sloppy weather for the stone sinks out of sight in the mud and adds to the cost of the job. Before the first layer is spread, the ground, according to Cornell's James Spencer, "should be moist enough so you can pack it in your hand without it being sticky or sloppy. Just don't pound it when it's dry or when it's sloppy wet."

A gravel or stone lane should be graded so the crown slopes away from the center toward both sides. This, coupled with the drainage furrows flanking the lane, should keep it dry. Maddox tried to hit the proper slope for the crown of a lane, which is a half-inch drop per foot of width away from the center.

Material used in lane building are determined by what is available within sensible hauling distance. Maddox was lucky to be in a location with an abundance of limestone, for highway engineers agree that few materials are better for road building. In other areas materials include slag, cinders, shell scoria and caliche. The most common of all is gravel.

The best gravel for the job is one that contains particles ranging in size from pebbles down to clay. The smaller particles help hold the large ones together. James Spencer suggests that the mixture contain 60 to 70 per cent gravel, 25 to 35 per cent sand and 3 to 10 per cent silt or clay. If the road is to have a smooth surface the top three or four inches shouldn't be built with gravel larger than one inch. Actually, most gravel pits and banks approach these proportions of gravel, sand and clay. Gravel that contains too much dirt won't pack tight enough to make a strong, smooth lane. And if you're the type of workman who likes to rule out all the guesswork, here's a method of checking gravel for dirt.

Oven-dry a representative sample and weigh it. Cover it with water, shake it, let the sand and gravel settle for a few seconds and pour off the muddy water. Continue this until you pour off clear water. Oven-dry it again and get the total weight. The weight of the silt and clay is the difference between the two dry weights before and after washing. Separate the sand and gravel on an eight-mesh screen and weigh each. From these three weights you can compute the proportions of each in the mixture and if the gravel is too dirty, get gravel from a pit with more sand in it.

What Does A Lane Cost?

The cost of building a farm lane is going to vary from one job to the next, but we can get a good idea of lane building costs by following through the costs of materials and labor on the job. For the sake of convenience in fitting the costs to your needs, let's look at the construction of a new 100-yard lane on a farm three miles from a limestone pit. In studying the lay of the landscape the farmer learns that he'll need one culvert to carry water under the lane in a low spot.

Crushed limestone costs about $1.10 a ton at the quarry. Hauling charges are generally around 30 cents a ton for the first four miles plus an extra five cents a ton for each additional mile. In this case the cost of stone comes to $1.40 a ton. The job, if it's done in the manner of Jess Maddox, will require two inches of screenings on the bottom, six inches of larger stuff and another two inches of screenings on top. To put this 10 inches of material on a lane eight feet wide calls for 40 tons of rock for every 100 feet of lane. At $1.40 a ton that comes to $56 per 100 feet or $168 for the 100 yards.

In most cases preparation of the grade and roadbed can be handled with farm tractors and drags. But if the lane must be wrapped around a steep hillside or built across a particularly rough field the job may require a bulldozer. What this costs depends on the time required for the dozer to do its work at $12 to $15 an hour.

For carrying water under the lane in the low spot, 12 feet of 12-inch steel pipe will cost about $20. Reinforced concrete will probably cost a couple of dollars less.

Moving A Lane

People get used to lanes. If they're bad lanes, people gradually become accustomed to that too and finally decide there's nothing much to do about the situation. But actually if you have a lane you don't like, you can move it. The farm planners think there are many lanes that should be moved because they were put in with little planning in places where they shouldn't have gone to begin with. Most old farm lanes guide visitors right to the kitchen door instead of leading them to the front of the house. Other lanes were built where they are an eyesore.

Leo Orschell, who operates a 350-acre stock farm near Batesville, Indiana, recently moved part of the half-mile lane that links his buildings on top of a hill with the highway in the valley below. "A lot of people were afraid to come up that hill," he said, "and I didn't blame 'em much. Stall your car on that hill and you were out of luck." The steep hill caused him trouble in winter and spring when he had stock or crops to haul. Sand washed off and gravel rolled off.

He hired a bulldozer at a cost of $250 to make a new roadbed with a gentler slope beside the old one. He surfaced it with gravel and a few months later the bulldozer returned and put the finishing touches on it and leveled out a few spots. "It's almost as hard as concrete now," says Orschell.

Where dust is a serious problem on a lane, calcium chloride or rock salt will help. Calcium chloride is better but it costs about $25 a ton while rock salt costs about $6 a ton. These materials absorb moisture and keep a lane damp instead of dusty. The best way to use calcium chloride is to mix it into the top three inches of the road at the rate of a pound and a half per square yard and spread another half pound on the surface. Each year the lane will

need a new surface application of one pound per square yard.

Rock salt, spread two pounds to the square yard on the sub-grade before spreading the gravel, will help protect the lane from frost and help control dust.

None of the good work in building a lane properly is wasted if you decide later to cover it with blacktop and eliminate grading and ruts. The road base is built the same whether the surface is blacktopped or not. As a matter of fact, the layer of sand or other fine material beneath the rock is particularly important where a lane is to be blacktopped. A new lane should be used for several months and given a chance to pack and settle before it is blacktopped. Before the bituminous materials are ordered for surfacing the lane should be leveled, all ruts and holes filled and the whole thing rolled to compact any loose stone and give a smooth surface.

The best way to blacktop a lane is to hire a contractor and his special equipment for the job. The bituminous materials used for this type of paving are usually put down at a cost of about $1.25 per square yard of finished driveway or about $112 per 100 feet of eight-foot lane. A three-quarter-inch layer of blacktop on an eight-foot lane requires about three and a quarter tons per 100 feet of road and the material can be purchased at the plant for about $7 a ton. While a farmer might buy surfacing materials at this price he would seldom have the pressure equipment to apply it and the three-ton roller to finish it.

It's a good plan for the contractor to first spray the road with a cold mix to penetrate the rock and bind it. Once the blacktop surfacing is spread and rolled, it cures much as concrete cures. If it's possible to have it put on in the morning after the milk truck has come and gone and to keep traffic off it all day, it will have a better surface.

Maintenance

Rough spots in a farm lane, like tooth decay, should be caught early to keep little holes from getting big. Keeping a lane in shape is a job that never ends, but it needn't be a big job. It's a good plan to keep a pile of gravel or crushed stone handy and add a few shovelfuls to the lane whenever holes begin to appear. Farm lanes should be graded two or three times a year to keep stone from ridging up between the wheel tracks.

Leo Orschell keeps a farm-built drag handy and hooks the tractor to it whenever the lane starts to get bumpy. "I think any farm should have a drag for this job," says Orschell, "or a blade for the tractor. Either one will do the job and it's a job that can save a lot of trouble later."

When holes are mended individually, the job is much the same as building a small section of road. If the roadbed has disappeared into a soupy spot it should be replaced with sand or fine crushed stone, a layer of gravel or coarse crushed stone, and a topping of fine stuff to bind it. Since the filler will compact and shrink it is a good practice to lay on enough to make a bump out of your hole; the next scraping will level it off.

Speeding vehicles can make fast work of tearing up a lane. Near Laurel, Indiana, Earl Hoffman built a half mile of lane so anglers could drive to the three commercial lakes he built on his farm. He figures the lane carries 10,000 cars annually and maintenance costs him $250 a year. "If I could make them keep their speed down to 15 miles an hour," he says, "it wouldn't cost half as much to keep my lane in shape." Some farmers discourage hot-rod driving by building low ridges across the lane every 200 yards or so and giving drivers their choice of slowing down or shaking the daylights out of themselves or their vehicles.

While it is probably true that some statistician has gone to the trouble of computing the average cost of maintaining farm lanes, you'd go a long way to find a lane that is either average or typical. Every lane presents its own problems depending on such things as the lay of the landscape, how well the lane was built, the type of materials used for it and the traffic load it carries. Good maintenance, however, seldom demands more than a few hours a year from the farmer and his tractor and perhaps a few loads of rock annually.

After using his lane for 32 years, Leo Orschell finally hit on what he now considers the most important rule for keeping any farm lane in good condition. "By golly," he says, "I never drive in the same rut twice."

THE AUTHOR: George Laycock was born and raised on a hilly farm in eastern Ohio. After a stretch in the army, he returned to Ohio State University to complete his work at the Agricultural College. Since graduation he has worked as an Associate Editor of THE Farm QUARTERLY and has now chosen the life of a free-lance writer.

ROAD MAINTENANCE is best done with a scraper. The adjustable blade pulls back the straying gravel onto the roadbed and levels off the high center.

Tailored Pastures

Four successful stockmen tell how they fit their pastures to their stock

Pork Producer

Ladino 1 pound,
Red Clover 8 pounds
per acre of pasture

"Sure you can trust a sow and her litter on pure ladino," says Peter S. Thompson, who raises 600 pigs a year near Easton, Maryland. "Hogs have simple, human-like stomachs and seldom bloat. I don't include any grass in my hog pasture." His litters run on a field only one year; then it goes back into corn and that reduces the sanitation problem. This spring, as in past years, he raised over 300 pigs from 38 sows on pasture. "It saves a lot of grain," he points out, "up to a third. Saves labor, too. Ladino can supply nearly half the supplement normally fed in dry lot. Young meadow crops are rich in calcium and phosphorus and vitamins in which grains are usually low. Hogs need quality, not quantity in range.

"Our rotation is corn, followed by fall sown wheat or barley, with only one year of ladino and then back to corn. We get a lot of rain here all winter, so we spread the fertilizer effects by putting it on in two doses. The small grain gets only two hundred pounds of 4-12-8 in the fall. The next year we cut what we call stubble hay, the new red clover along with combined straw. The following spring we top-dress with 500 pounds of 5-10-10 and the ladino comes in thick and fast. It holds up well until heavy frosts. We get ten months grazing that way. I haven't found that the usual recommendation for around here of a seeding of two pounds of ladino per acre is any better than one pound, so that is what I use. You can't beat ladino for hogs. An acre of it is worth a hundred bushels of corn in producing pork and will carry 17 to 20 grain-fed shoats. Ladino stands a lot of one-spot grazing hogs and bounces right back."

Dairyman

Lespedeza 10 pounds,
Timothy 2 pounds,
Alta Fescue 2 pounds
per acre of pasture

For twenty years, lespedeza has been the major forage crop on the 450-acre Ashley Trimble farms near Trimble, Illinois. "We can depend on lespedeza," says Trimble. "It not only is the basis for our pasture, but we combine 50 or 60 acres for seed every year, and last year we furnished the University of Illinois with 190 tons of lespedeza hay. We carry over 160 head of dairy stock right along, and we are milking about 85 head Lots of folks think of lespedeza as poor land clover. They put it on marginal land and they get marginal production. Here it grows 18 inches to two feet tall, and makes two to three ton of hay an acre.

"In a dry August when most pastures are scorched, lespedeza gets as green as a new ten-dollar bill and really makes the cows turn out the milk. I've heard farm speakers say a cow producing 50 pounds of milk will eat up to 150 pounds of green growth a day and that pasture alone—good pasture—will produce 20 pounds of milk. Lespedeza is the answer for us. Cows can't pasture it so close it won't reseed itself. Makes the greenest hay, too, without special effort and its haying time comes in the early fall when other farm work is slack."

The Trimbles use fall-sown rye or spring-sown oats as a nurse crop, with 200 pounds of triple 8 for grain fertilizer. Meadow stands are left for three years, without extra fertilization except for generous applications of phosphated manure. "We used to sow 20 pounds of lespedeza alone, but more recently my son John has been including the timothy and fescue and often a half pound of ladino, according to the field. We leave a stand for three years."

It pays to pamper an animal's appetite. Farm animals vary greatly in their pasture likes and dislikes, because of their digestive differences. Sheep thrive on short, immature growth, beef cattle can utilize coarser forage, hogs require low-fiber, succulent grazing. To give your pasture the special shade of green on which your animals do best, calls for the right seed bag and the right management. Here are four successful livestock farmers who adapt their seed mixtures not only to their soil and climate, but to the needs and preferences of the livestock that make them money.

Sheep Breeder

Alfalfa 6 pounds,
Timothy 4 pounds,
Trefoil ½ pound
per acre of pasture

Joe Bryan of Portland, Indiana has shown Oxford sheep on a ten week circuit almost every fall since 1896, when he was fourteen. He expects the same fields to feed his sheep winter and summer. Last year he pastured one hundred ewes and their lambs on one 14-acre field from May 20th to November 1st and got a two-ton cutting of hay per acre from half of it.

Bryan's plan includes rye seeded by airplane in standing corn, both for winter pasture and as a turn-under crop before second year corn. Then comes oats, seeded with the alfalfa-timothy-trefoil grass mixture and fertilized with 300 pounds of 8-8-8.

Bryan aims at 95-pound lambs for the July market. Just before breeding time, they go on the alfalfa and trefoil. By then the timothy has slowed down. "The birdsfoot reaches its peak late, in dry weather, and helps prevent bloat in the alfalfa just as the timothy does earlier," Bryan has found out. "But most people will have to sow it heavier than I do on this built-up ground or they won't get a stand. The older birdsfoot gets, the better it yields if it's not grazed the first year."

His first cutting is fed as dairy hay. The second and third cuttings, almost pure alfalfa, make top-quality sheep hay. In March of the second year the field gets 200 pounds of superphosphate per acre before the sheep are turned in. That year the trefoil really gets going and competes well with the aggressive alfalfa.

"Sheep are given second table on too many farms," Bryan says. "Sheep aren't scavengers and they can't live on brush. Sheep make better meat on pasture alone than any other farm animals. But they can't produce both milk and wool, both of which are high in protein, without the real grazing that alfalfa and trefoil give. Sheep want fine, short and tender growth."

Beef Cattleman

Brome Grass 10 pounds,
Alfalfa 8 pounds,
Ladino 1 pound
per acre of pasture

J. R. Patton, a Licking County, Ohio grass farmer, keeps 255 acres in hay and pasture for 50 Hereford brood cows and their calves. The young stock are sold as feeders or bred heifers. In 1952 some of his best yearlings gained over two and a half pounds a day on his brome-alfalfa-ladino mixture. "Keep the soil shaded and you bring up the moisture to feed the roots in summer," he says. "It works the opposite in winter; a good growth left on the field holds the warmth of the soil to protect the plants." He pastures in rotation when the growth reaches ten inches and he moves the cattle when the grass is down to about six inches.

The cattle, 105 head in all last season, began grazing in April on 15 acres of blue grass. They stayed on blue grass for nine days in the spring, then went on to alfalfa-brome. In July the blue grass was used for another 10 days. They were back on alfalfa-brome pasture then until November 1st.

Patton makes his seeding in wheat, fertilizing with 425 pounds of 5-10-10, with the same analysis later applied to meadows.

"You've got to have more pasture than you need in June if you're going to have enough in July and August," he says. "We make silage from the excess around Memorial Day. We had hardly any spoilage in our stack silo this year. Just dumped it on the ground and packed it with trucks. Alfalfa-brome makes fine silage.

"We lost three yearlings from bloat several years ago. One day when I was crossing the pasture with the mower, I let the bar down and cut a swath. The cattle ate the cut stuff quickly. Since then I mow a swath around the field every day and the cattle eat it right up. We have had no more bloat losses."

By Al Haller

HOGS from PIGS

"Feed a pig and you'll have a hog," they used to say, but to get a 200 pounder in six months is another matter.

The farmer who sets out to put 200 pounds on his hogs in six months will run into more angles than an inspector in a hair pin factory. Yet the basic rule is fairly simple: start them out fast and keep them growing to six months with no strain, no pain, no slow-ups, and no let down. To get them off to a good start the farmer is going to have to put in long hours at farrowing time. The first two days, after all, are the most important in the pig's life—it is during this critical period that most losses occur.

Until the moment he is farrowed, the pig has spent his time in a nice, comfortable, protected environment inside his dam. Then suddenly he is dropped wet and squeeling from a temperature of 102 degrees into the cold world where the temperature may range from a bitter zero degrees to a relatively cozy 80. The best he can hope for is a 20 degree chill-off. The shock is comparable to falling through the ice on the farm pond when you're hot from skating.

This little pig that is going to market in six months should be born in a clean farrowing pen with a good guard rail to protect him or, better still, in a pen with a farrowing crate to keep his mother on her side of the bed. He should have heat supplied in the form of a heat lamp and should be dried off to protect him from chilling. Then he should be put to nursing to give him a bellyfull of colostrum and get him off to a fast start.

The farmer who does a better job than his neighbors usually gets a bonus—with pigs the bonus comes during the first eight weeks of life, for then the gains are cheap. Dr. Damon Catron of Iowa State College, measured the solids a pig consumes during this first two months and found that it took only one and seven-eighths pounds of feed for every pound of gain—and that includes the solids in the milk. At this rate, even the poultry producers can't compete. As the pig gets heavier, it takes more feed for each pound of gain. When he is around 75 pounds he is eating 3.5 pounds for each pound of flesh he puts on; at the 200 pound mark he is eating 4.3 pounds of feed for each pound of gain; and at 300 pounds it takes 5.3 pounds of feed to boosts his weight a pound. If a hog man is going to scrimp on protein and supplement costs, he shouldn't do it during the first three months of the pig's life.

Antibiotics, too, do their best job of promoting growth during the first few weeks. That was one of the reasons for the development of artificial sow's milk—to give them a slug of antibiotics early. The sow, herself, seems unable to put any of the wonder drug into her own milk no matter how much of it you may feed her. For those farmers who want to take advantage of the sow's ability to produce milk for her young—and that is the majority of the hog raisers—a new device has been worked out for giving the little pig some antibiotic. Small pellets of the drug are implanted beneath the skin just behind the pig's ear. A device similar to a hypodermic syringe is used to make the puncture and pop in the pill. By the time the antibiotic has been absorbed into the blood stream, the pig is eating solid feed to which more antibiotic has been added.

Arkansas tests showed that the im-

SANITATION before farrowing insures the pigs a fast start without worms or filth to slow them down.

A FARROWING CRATE and a heat lamp protect these new pigs. They should be drenched on the third day with iron-copperas.

planting of antibiotic in the new-born pig gave it a three pound advantage at weaning over normal pigs. At Illinois, however, other tests showed no advantage at all in the practice. Wisconsin feeder pig raisers who produce pigs under farm conditions have been using the pellet for some time and feel that they get a weight gain and a health protection from the implanted pellets.

Winter farrowing in most of the hog belt means off-the-pasture-farrowing. This immediately poses one of the most important as well as one of the most grossly neglected baby pig requirements: Iron! Iron! Iron! I believe that the lack of iron for the baby pig is as responsible for as many unthrifty, backward, scouring, slow-growing, poor-doing, scroungy, runty pigs as any single factor. The sow just doesn't have enough iron in her milk. If she could digest nails and if she ate a keg a day, none would get to the pigs because somewhere between her throat and her nipples she has a very effective iron screen just as she has an antibiotic screen. Until the baby pigs start eating grain, iron must be supplied in another way. The simplest and cheapest way to do this is to drench the pig at two or three days of age with an iron-copperas solution which any veterinarian will have on hand.

A concentrated iron-copper pill can also be used instead of the drench. It takes a little technique, however, because trying to poke a pill down a baby pig's throat is like trying to poke a pencil into a spinning bottle. A hog man will soon find that if he tries poking with his fingers he ends up with a lot of scars. There are two good ways to do it. One is to use a long nosed pliers, holding the pig by his head and forcing his jaws open and then carefully placing the pill into the pig's throat and crushing it (the pill, of course). For a man who is dexterous, the simplest way is to pick the baby pig up by his ear and about the time he is blatting his brains out with his tongue stuck out to the limit—pop the pill in without even touching the pig's mouth. The furious pig takes one gulp and down goes the pill. The only advantage of the pill over the drench is that there is less chance of getting foreign matter into the pig's lungs and causing pneumonia.

Once the pig is dosed with iron, put fresh dirt or sod in the pen each day for them to root in until they are eating grain liberally. But for heaven's sake don't dig up the sod from some old hog lot where it's liable to be infected with everything from bull nose to round worms—take it from a wood lot, roadside, or any land you know to have been free of hogs for many years.

Sows are bred to produce pork, not as dairy animals. The average hog belt sow is going downhill on milk production after the fifth week of her lactation. At five weeks of age the pig finds himself at least

(*Continued on page* 87)

THERE is no hind teat on a creep feeder where runts will get less than the big fellows. Sugar-coated pellets are now used to start pigs on self-feeders.

THE FILTH, not the boy, will take the curl out of the pig's tail. Neither antibiotics nor good feed can take the place of sanitation.

The Friendly Meal

To a country boy heading into his teens, supper was the high spot of the day.

By James D. Frye

Supper always seemed to be the friendliest farm meal. Certainly in the 80's it was the most pleasant hour of the day for an orphan boy heading into his teens.

Around lighting-up time, I would make for the kitchen with its pleasant odor of dried apples that dangled on long strings above Grandma's high-backed "Home Comfort" range. Earlier in the day I had watched her Vermont-proud, straight back as she swivelled from under her "broad shelf"—that wide surface housewives dedicated to cooking uses—to a barrel of buckwheat flour, measuring it out by the scoopful, preparatory to bread making.

The scent of Grandma's bread dough baking in the elevated oven at the rear of her wood burning range had presently drifted beyond the comfortable old kitchen, an enticing aroma to young nostrils. Buckwheat, rye, graham, all were common flours of my Vermont boyhood.

Such griddle cakes as Grandma could whisk up from India wheat taken from our own acres direct to Parson's grist mill, put through his huller, ground coarsely, and returned to us in the form of flour rich with yet-to-be-discovered vitamins! Spread those cakes rim to rim with fresh country butter, right out of the butter molds with their pineapple and leaf patterns, spill some of Uncle David's pale maple syrup over a smoking pile, and you had an epicure's dream on the tines of your fork.

Supper was a simple affair. The dining room of my grandfather's weathered frame home was non-existent. All meals, prefaced by a sincere blessing, were eaten in the kitchen at a long table which easily seated ten. It was supper which found us most relaxed. No rush for after-breakfast chores or no feeling of the work ahead, which hung over dinner and urged us back to the fields.

This was Parson's Grist Mill in Concord, Vermont. India wheat taken here came home as coarse flour, to make griddle cakes whose flavor lasted a lifetime.

My small tasks were nearly all done at eventide. I had carried in short chunks of split white-skinned birch until they rose in a high, even pile from the big woodbox next to our stove. I had helped Uncle lug in some pails of milk to pour in the shining staircase of four, six, and ten-quart tin pans on our milk room shelves. In my search for eggs I had braved the sound and fury of the setting hens, and these I had placed carefully on the mound in Grandma's blue rimmed earthen bowl. What custards they would make, once Grandma broke a dozen eggs into her mixing bowl! What cookies, golden with the yellow of uncounted yolks!

If summer lay upon the hills, I would have spent my day running over green slopes: catching unwary grasshoppers: eating the comb filched from a bumblebee's nest: swimming with some barefoot crony; driving Uncle's small herd to and from their sloping pastures: loitering at the old barway where the brakes rose almost to my waist in order to gather a handful of blackberries. If snow whitened those same hills, I'd been looking for a denned-up woodchuck or sledding down long, glistening slopes, to come home with crimson cheeks and a lumberjack's appetite. When I swung up the low bank before the homestead lot, I looked forward with a twelve year old's open delight to a big meal. No formal dinner has since brought me the same glow of satisfaction.

'Soon as I pushed open the kitchen door, two house cats leaped after me. Indian pudding? Must be *that* I smelled. I could even hear the faintest sizzle in the pudding's center, on taking a hasty peek into the oven to reassure myself. Or potato soup, thick, full of grated onion, topped off with a fast spreading blob of butter when it reached the table in a generous all-white covered tureen. With this were served puffy split crackers, known rightfully to us, since they were made in a neighbor town, as "St. Johnsbury" crackers.

Possibly pound sweets, baked until their swelled sides burst and the mixture

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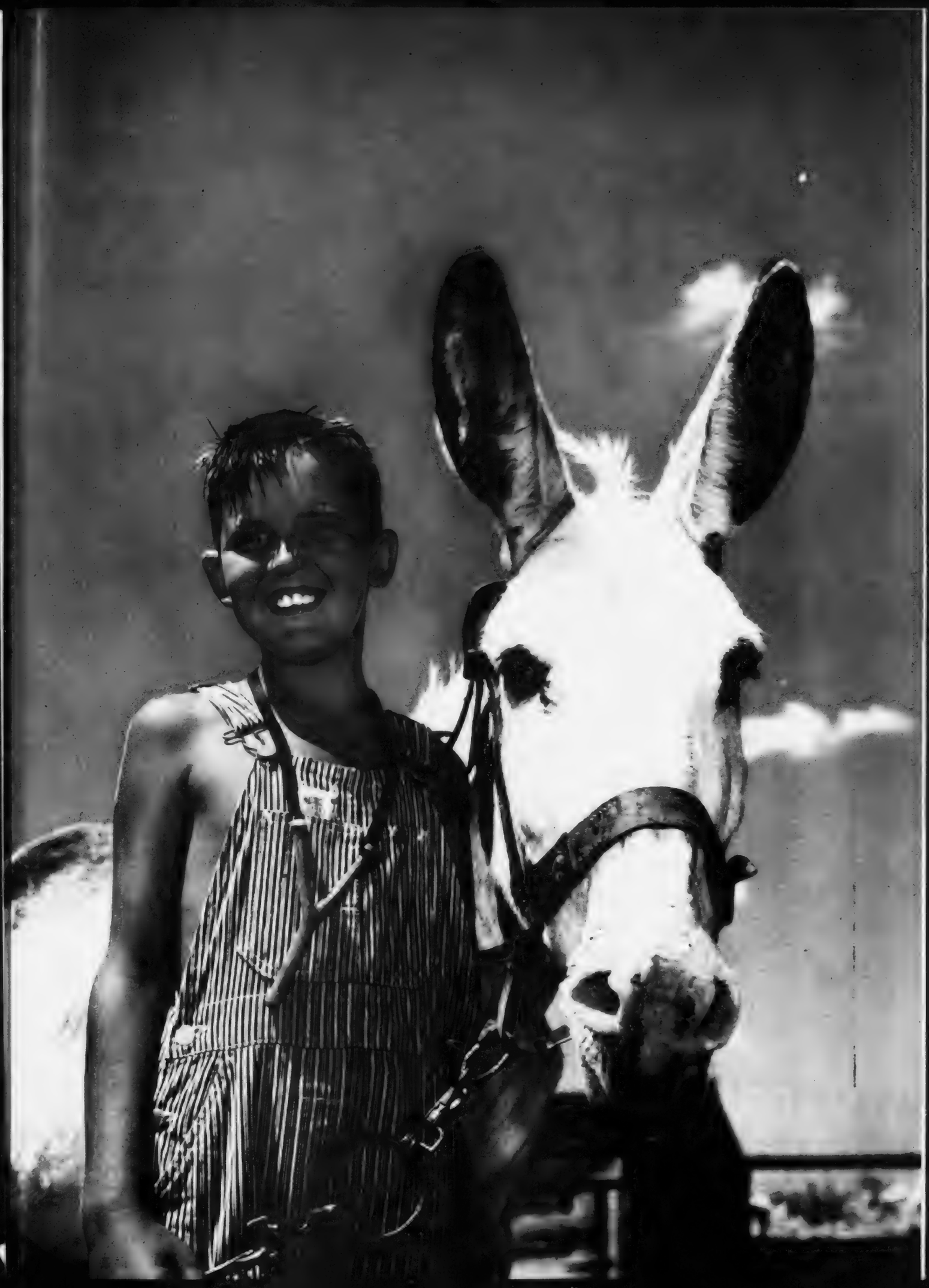


MORE LIVESTOCK JUDGING is done on the farm than in the show ring—and the most important judge is the exhibitor himself. Selecting the right individual to go to the shows is the basic chore in all fitting and showing. These vo-ag students are learning early what a tough job it is to separate the good ones from the almost good ones.

By C. Chester Charles

Fitting and Showing

Competition in beef cattle is keen. Working with a medium he loves, the good showman is an artist whose every movement has a reason.

"I have never made money showing cattle, but I never made money with purebred livestock until I began showing them." That's the way more than one veteran of the show ring sums up his reasons for following the tanbark circuit.

Even if he hadn't come home from Chicago's big International Livestock Exposition last fall with the purple ribbon and the cash that goes to the Grand Champion steer, Herman Purdy would still be a good man to seek out for advice on showing cattle. For Purdy has judged many top shows himself and has devoted a good portion of his life to teaching animal husbandry at Ohio State University in which capacity he has developed some first class young exhibitors and judges.

Standing on the tanbark of State's Plumb Hall arena before a semi-circle of students in one of his judging classes, Purdy leads off with the fundamentals:

"More livestock judging is done outside the show ring than in it. Any successful livestock man has to be a good judge of livestock. Everytime we select outstanding calves to fit for show, we are judging, for we are making a careful analysis of animals and measuring them against a standard commonly accepted as the ideal.

"Our biggest job is to decide what cattle most nearly represent the ideal. The standards set up in the ring are not artificial, for the show is simply a footrule by which progress in breeding is 'measured and kept in pace with the change in public needs and tastes. Today we are trying to produce medium-sized cattle that are short legged, thick, compact and deep bodied. In a young calf a short, broad head is almost a must, because that is usually a good indication of the calf's body proportions. In the beef cattle business we have four different groups to satisfy—the breeder, the feeder, the packer and the consumer.

"Any questions before we bring out the calves?"

"Yes, sir," a sophmore raises a hand. "What's wrong with a lot of good beef on a long-legged animal," he asks.

"That's a good question." Purdy comments and begins his clarification. "Many features in the make-up of beef cattle seem to be associated with each other. A long legged animal is usually long and narrow in his head, long and narrow and also shallow in his body. He is usually slow maturing. And the longer the legs the more bone to discard on slaughtering.

"Cattle are never too short legged if they have rugged bone and legs correctly set. We should guard against cattle that are fine boned and lack weight for age.

"Of course," says Purdy, "no one is ever going to produce the ideal steer. If all of us were able to produce the ideal, the interest and competition in showing and trying to improve cattle would be gone. Those four groups the exhibitor is trying to satisfy all have different ideals. Which reminds me of the way Dad Weber, Dean of the Kansas State College, puts it. He says the packers' ideal steer would be a gutless, boneless, hideless, footless, tailless and headless animal."

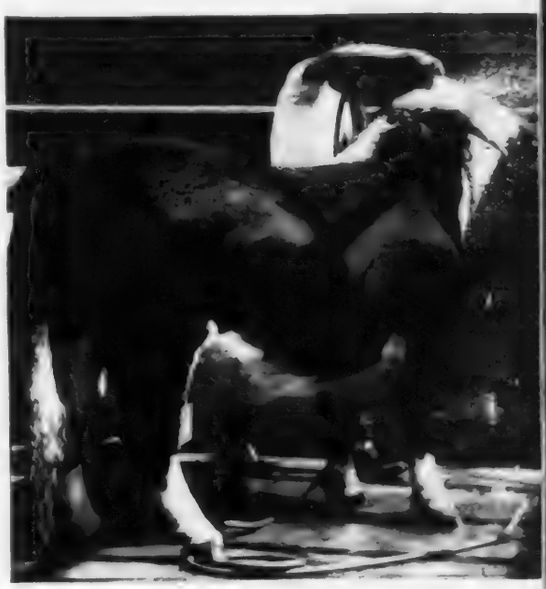
With that introduction Purdy signals the student at the gate and four calves trot in from the barn. The students clamber into the ring, size them up from all angles, mark their score cards and turn them in to Purdy, who concludes the session with some remarks on the selection of material for the show circuit.

The most outstanding calves in the University herd are fitted for show. "We make many mistakes in our selections and find out later that a calf that we had felt was just average is really very outstanding," Purdy admits. "Some of us make the mistake of selecting our show calves when they are too young. In most cases, however, an outstanding calf is a good one to tie to and you should give him every chance to develop that you possibly can."

Beginners starting out with purchased material can usually do better with steer or heifer calves since bull competition is keener and judges are more critical of bulls because of the value that can be placed on winners. Two calves double the chances for success. Calves get sick, go to pieces on feed or mature disappointingly. Some never develop what is called "style." When buying from a reputable breeder the valuation he places on his stock will indicate his preferences.

Fitting isn't Fattening

As is general in show herds, animals in the Ohio State string are chosen and put on feed months ahead of showing. The younger the animal, the more time is required to balance growth with finish. The youngest show class is for junior calves



THERE'S NOTHING LIKE a good bath to improve life's outlook for man and beast. Frequent washing isn't necessary—for the show heifer. A few times during the latter part of the fitting process are enough.

dropped on or after January first of the year shown. Usually, young stock are put on nurse cows and creep fed a mixture consisting of equal measures of cracked corn, whole oats and rolled barley. No protein is fed suckling calves. Purdy feels that too much protein will tend to throw the calf off feed and cause him to be faulty on his legs. With somewhat older calves, if a nurse cow is not available, linseed pellets are substituted.

At about six months of age, both steer and heifer calves on full feed will be consuming about 2 pounds of grain for each 100 pounds of body weight. The mixture, which is hand fed, consists of one measure each of cracked corn, rolled oats, rolled barley and a half measure of bran. Mixed clover-timothy hay is fed free choice, and each animal receives linseed meal at the rate of a pound and a half per day. The linseed meal gets into the ration on its reputation for producing sleek coats and finish.

For better individual attention and control, Purdy recommends that calves be fed singly or in pairs. He likes to give them all they will readily consume in 45

(*Continued on page* 108)

By Walter Weiss and Charles R. Koch

Stack Silos

If you're wishing you had an extra silo for that grass, you can follow the example of some of the best farmers and just stack it.

There's no need to rush out for a final fleeting look at the old white silo. She'll be around for a long while despite the current enthusiasm for stack silos. But these stack or field or horizontal silos—call them what you will—have their place in providing a cheap source of roughage for feeding cattle and sheep.

A stack silo is just that—a pile of silage stacked either right on the surface or part above ground and part in a shallow trench, with no building or container of any kind around it. They are efficient, too, not just makeshifts that a farmer might resort to in case of an emergency. The silage that comes out of a well-made stack is of just as high quality as any that can be fed out of the more conventional tower types. While they can be used equally well for corn or grass, the current trend toward grass farming is creating a major problem for many farmers as to how best to utilize the increased output of their meadows. For this reason we shall confine our discussion here to grass—and by grass we mean, of course, either grass, legumes, or a mixture of the two.

The diagrams on page 66 give an idea of each of the various types of stack silos and the probable amount of spoilage that may be expected. Packing is the key to success in making good silage and spoilage runs much higher in those arrangements where it is impossible to pack well on the sides. Don't let the relatively high percentage of spoilage indicated for some of these stacks cause you to shy away from them. A good way to look at it is like this.

Any good upright silo of the more popular makes will cost around $15 for each ton of silage it will hold. That would make a 100-ton silo cost about $1500. A well-packed drive-over type of stack silo should not suffer more than ten percent spoilage: that would be 10 tons out of a hundred. Ten tons of silage at $8, which is a pretty fair figure for silage, would be $80. But the annual cost of the upright job—interest, taxes, depreciation and maintenance—at the low figure of eight percent would be $120.

The trench silo has been with us longer than the stack idea. Like the stack it was conceived in an effort to provide silage storage with a minimum of capital expenditure. If well built and logically located it works fine and holds spoilage to a minimum. But a practical trench isn't cheap to build. The bottom and very often the sides, too, must be lined with concrete if it is to be a permanent structure and provision must be made for some kind of an all-weather lane from the trench site to the feeding area. Again, many farms just don't have a hillside or other well-drained spot convenient to the

WHILE a self-unloading wagon is perfect for the job there are as many ways to build a stack silo as there are farmers who are building them. There is no substitute, though, for packing. To insure good silage in a stack you have to keep that tractor running back and forth over the pile continually.

barn. In those instances the trench is ruled out for lack of suitable location.

So the stack was born. Many stacks are based in shallow trenches not more than a foot and a half to two feet deep, the dirt from which has been piled along the sides above ground level to give support to the upper portion of the stack.

Other farmers have rejected the trench idea completely and simply pile the silage right on top of the ground. Still others have built upright stacks using picket fencing to serve as a mold.

If you are seriously considering building a stack, the amount of silage you plan to feed will be the most important point in influencing your decision as to which of these types might be handiest for you. If you are going to put up 200 tons or more and feed out a ton or more a day, a drive-over stack would seem to be tailored to your measure. For less than 70 tons, the picket fence type of stack is best.

Location

Once you've decided upon the kind of stack you are going to build, the next problem is location. The points for consideration here are convenience in feeding, wind direction, possibility of self feeding, and size of stack. And location is important if you want to keep the family happy. Joe Manthy, out in northern Iowa, says, "I darn near lost my wife the summer I piled a stack of silage about fifteen rods due west of the house. Brother, did it stink!"

To figure the size of the stack a good rule is that one ton of hay equivalent, if put up as silage, equals three tons, and a cubic foot of settled grass silage weighs approximately 40 pounds. Now, let's say that you have 20 acres of first cutting of meadow that will make two tons of hay to the acre. This means you'd have 40 tons of hay, which when made into silage, would be equivalent to 120 tons. One hundred and twenty tons are 240,000 pounds and that figure divided by 40 pounds per cubic foot indicates that your silage will require 6,000 cubic feet of space. Five feet would be a good height for your stack when settled. Six thousand divided by five makes an area of 1200 square feet that the stack will occupy, which means that it should be 60 feet long by 20 feet wide.

The 20 foot width is about the minimum for a drive-over stack. This width will permit hauling and packing equipment to pass on the stack when unloading and leads to efficiency in operation.

Site Preparation

If you are going to lay your stack in a shallow trench you'll have to remove the soil from an area of the size indicated by your calculations. The soil scooped out is piled along each side to form an earth ridge to support the stack and keep out surface water. It's a good idea to cover the bottom with rock or broken stone to keep it from becoming boggy during the feeding season. If, after a season of use, the site proves handy for a permanent location a concrete or asphalt floor would be money well spent.

Proper drainage is very important. It can best be achieved by locating the stack so that the shallow trench will slope lengthwise and by making the bottom of the trench about six inches higher in the center than at the sides to effect a crown. For each 50 feet of length of the trench there should be approximately one foot of fall.

All the equipment needed for this site preparation is a tractor, plow and manure loader.

Strictly Surface

If you don't want to go to the trouble of digging even a shallow trench—don't. There has been a lot of good silage fed out of stacks built right on the surface.

Orleton Farm, in Madison County, Ohio, put up one of these last year, the first they ever tried, and the results weren't a bit disappointing. Lee Zimmerman, quiet, lanky, bespectacled foreman of the cattle department on this big beef-hog operation Jeeped us back through the woods on a grey January afternoon to the field in which this 60 by 24 foot self-fed stack was the center of attraction for a herd of 77 commercial Hereford cows.

"We were pasturing hogs in this field," he explained, "and late in June it began to get away from us, so we just cut it up and made a stack silo. We plowed out about eight inches of soil for a base, but that wasn't necessary at all. This year, we're going to build an even bigger one and set it right on top of the ground."

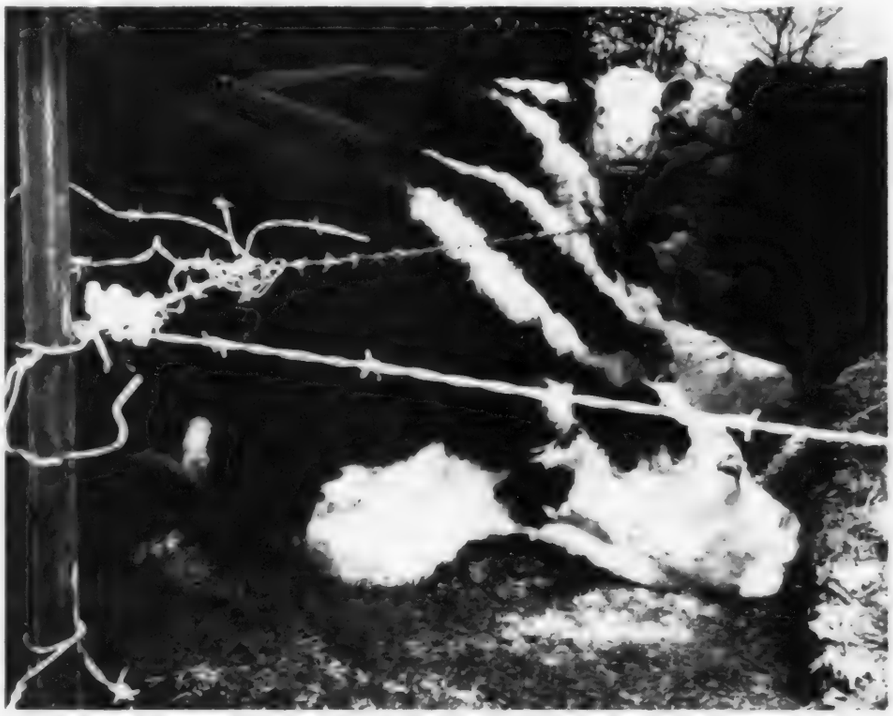
The "slurp" of a lower half of a cannon bone and hoof coming up out of the muck emphasized his next point. "That mud is a little inconvenient right now," he admitted. "We're going to put a gravel base under our next stack, though, to take care of that."

In building the Orleton stack, the bigger part of a mixture of 50 acres of red clover, timothy, ladino and alfalfa was picked up with a chopper immediately after cutting, blown into wagons and hauled to the stack site where it was unloaded with a vacuum blower. The blower had to be moved three times on each side of the stack and once on each end.

The pile was laid out north to south, its settled height being about six feet at the highest point, running on down to ground level on the north end so the tractor used for packing could be run off. It had no cover of any kind; yet there were no more than four to five inches of spoilage on top, possibly as much as a foot on the side. Spoilage was more pronounced toward the north end. Zimmerman attributed this to two factors.

"First of all," he says, "it takes a few

Tired of forking silage? Try this method. At Orleton Farm in Madison County, Ohio, a well-fed bunch of Hereford cows reach over or dive under an electrically charged wire to self-feed from a big stack of grass silage.



days to build a stack like this and by the time we got around to cutting the forage to go into the north end we were also baling hay in another field at the same time. We'd cut hay to go into this stack, then go over to the other field and bale a while, then come back here and work on the stack. That way our forage got too dry.

"Along with that we let up some on the packing and the result was the silage just didn't turn out as good as it should have on that end."

Like others using this kind of silo, Zimmerman has found that his beef cattle will eat at least half of the apparently spoiled silage with no ill effects.

One of the best features of this stack is the way it is self-fed. Rate of consumption is controlled by one strand of electrically charged barb wire stretched around the stack. The stack was opened on the west side and the cattle eat only from that side reaching over or under the wire for the succulent feed.

"You'd be surprised the work this saves," Zimmerman points out. "With an upright silo you have to get up in the silo, throw the stuff down into a truck and haul it out into the mud to feed. Now all I do is move the charged wire about once every three days.

"It's a real big saver on hay, too. We fed twice as much hay last year as we've fed this winter."

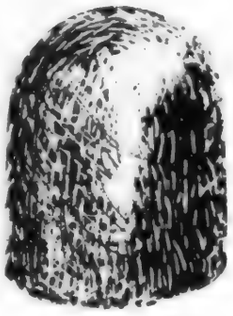
The Orleton cows get 15 to 20 bales of hay and 100 pounds of soybean meal per day in addition to the silage.

Making Good Silage

The Orleton experience points up several important facts on this matter of grass silage in general and stacks in particular. The first of these is packing. Packing, packing, packing is absolutely essential in these low piles. In a big upright silo, the weight of the material itself piled up thirty-five or forty feet in the air almost automatically insures good packing. Not so with a stack no more than eight or ten feet high at the most. So the only thing to do is run that old tractor, preferably a wheeled model with additional weight on both front and rear, back and forth over the stack. Keep it up for at least a week after the stack is completed. The air must be forced out to permit the formation of the lactic acid so essential to good silage.

SILAGE STACKS like this one and the one immediately below can be built up with picket fence molds. Some farmers are able to build them just like hay stacks without molds of any kind.

THIS STACK and the one above are usually about 20 feet in diameter and 12 to 15 feet high. Packing is more difficult than in the run-over type of stack and spoilage will generally run higher —in a poorly made stack as high as 40%.



THIS long, loaf type of stack, with a settled height of six or seven feet should not be subject to more than 15% spoilage, at the most, if properly made.

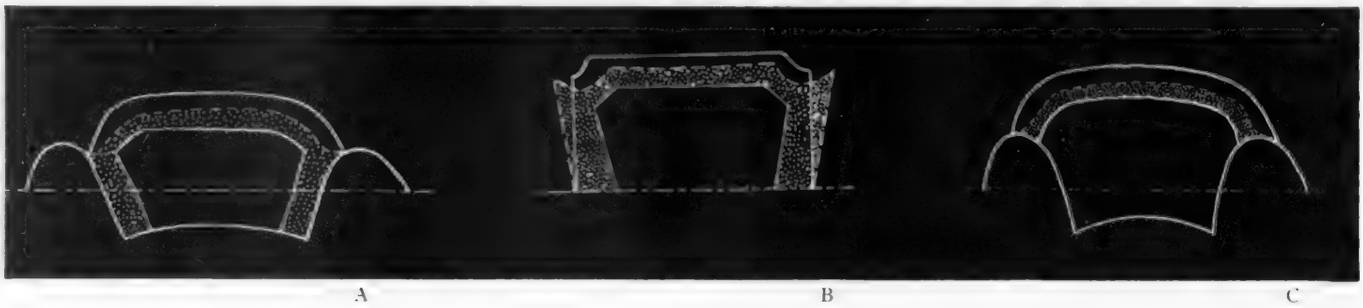
Next point is the moisture content of the grass-legume mixture as it goes into the stack. The first forage put into the bottom of the stack should be relatively dry. A moisture content of 65% to 70% would be about right. If it is immature and succulent, it should be well wilted. When too much green, cold, wet material is put in the bottom, or it is put in too fast, a green, slimy foul-smelling silage will result. So the relatively dry material should go on the bottom, where the pressure is greatest, and the green, wet forage —material with a moisture content of 73% to 76%—should go on top.

The scientific basis for this is that the best silage is acid, with pH of 3.8 to 4.4. Its fermentation produces lactic acid, an acid stronger than either acetic acid or butyric acid, both of which are found in low grade silage. Lactic acid fermentation is induced when silage reaches a heat of 90 to 105 degrees and there are no free juices present. With excess air and excess heat, caramelization takes place. Molds form when oxygen is present at lower temperatures.

Butyric acid fermentation takes place in silage that is too wet or put in too fast. Such silage has a pH of somewhere between 5.0 and 6.0. It smells rancid and has less digestible protein than well-cured silage. Incidentally, the protein content of good grass silage will average around 14.5% of the dry matter, about twice the protein value of corn silage.

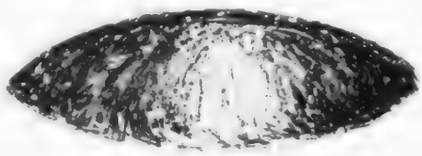
The Orleton stack was made of a mixture of grasses and legumes. While any forage crop can be made into silage, it is well to heed the warning voiced by the University of Illinois that ensiling is not a form of magic that can make high quality feed from low quality crops and weeds. It is easier to make good silage with a mixture than it is with either straight grasses or straight legumes. If straight

THE THREE DIAGRAMS, below, show the amount of spoilage that can be expected in two different types of stack silos. The solid line indicates the shape of the stacks when completed; the dotted line indicates the level of silage after settling; and the dotted area indicates the amount of spoilage. In A, rainwater seeped down the sides of the stack and spoilage extended all the way to the bottom. In C the rainwater was diverted over the dirt bank and spoilage was greatly reduced. B is a stack built completely above ground. The sides were forced out as the silage settled and spoilage extended from the top of the stack to the ground.



A B C

THE inverted plate stack can be packed most easily with the tractor and should have no more than 7% to 10% spoilage.



(*Continued on page* 67)

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grasses are used they should be put in at an earlier stage of maturity than legumes since the moisture content is lower in grasses than in legumes at the same stage of maturity.

The time to mow when making stack silage from first cutting of forage generally is as follows:

Straight grass—when there is a sprinkling of bloom;

Straight alfalfa—when at least half in bloom;

Straight red clover—when half in bloom;

Red clover and timothy—when clover is between one-quarter to one-half in bloom:

Alfalfa-bromegrass—when alfalfa is one-tenth to one-quarter in bloom.

The second and third cuttings are relatively lower in moisture at the same stage of maturity than the first cutting.

John Lane, of Cascade, Iowa, has had experience in putting up all three cuttings from 20 acres of alfalfa-brome meadow. His third cutting last year was entirely too dry and he now recommends mowing this last cutting when the alfalfa is no more than one-tenth in bloom.

No preservatives were used in putting up the Orleton stack and it has been generally found that preservatives are not needed with mixed forages. If you want an argument on that, though, look up Ernest Igo, in Kosciusko County, Indi-

(*Continued on page* 69)

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FARM BOOKS

(*Continued from page 22*)

analysis of variance" or "significant at the .05 level but not at the .01 level." Most of us are left slightly dazed and wondering, "Is that *good?*"

Dr. D. J. Finney, who is a lecturer at the University of Oxford, has come to the rescue of the layman by writing an understandable book about the basic concepts of statistics. The book is written for the person with non-mathematical background and is designed to teach him the fundamentals of the science. Dr. Finney does not try to make a statistician out of the reader in ten easy lessons; he does teach the language of statistics in 177 pages of interesting, rigorous reading.

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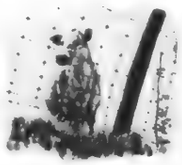

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Vegetable Growing—*by J. S. Shoemaker* $6.00
For truck farming or garden information this book is hard to beat.

Grasses and Grassland Farming—*by Hi W. Staten* $5.00
One of the best books on practical grass farming.

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Soils and Fertilizers—*by Firman E. Bear* $4.50
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Using and Managing Soils—*by A. F. Gustafson* $3.40
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Hunger Signs In Crops—*A Symposium* $4.50
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Complete Herb Grower's Kit—*by Rosella Mathieu* $3.50
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(*Continued from page* 67)

ana. Igo doesn't take a back seat to any man when it comes to making good silage and he says it just can't be done without adding exactly 17 pounds of salt to each ton of grass and legumes.

Finally, in reviewing Zimmerman's stack, comes the matter of cover. Top spoilage can be reduced to an absolute zero with a cover of sawdust or of two or three inches of ground limestone spread on top of sisalkraft paper. But, actually, the time lost in feeding and the cost for materials is worth more than the silage saved. Stack silo users feel it is best to forget the cover.

The use of the vacuum blower to unload the wagons is a practice that probably would not be followed on many farms, since this piece of equipment is not too common. Other methods of building the stacks are with dump trucks, or tractor-drawn wagons with false endgates; trailers; or front or rear mounted buckrakes in the case of long grass silage—silage put up as long, unchopped hay.

Many stacks, particularly the upright type are built with ordinary silo fillers or elevators. Elevators work better than the silo fillers because they are faster and provide a more even distribution.

The chopped silage must be spread in thin layers over the stack to eliminate bunching and air pockets. A tractor with cultivator shanks or scraper blades may be used for spreading. Long forage is corded or spread on the stack. A trailer with a mounted apron or a buck rake with a push-off feature can spread material while unloading.

Stacks the shape of an inverted plate can be packed most easily with a tractor without any danger of upsetting. If the sides are built up at all, keep the top of the stack nearly level so that loads can be dumped and packed close to the edges. If the middle gets high it is more hazardous to crowd the edges when packing than if the stack were level.

The stack should not be too high. A settled height of six to seven feet is good.

As was previously mentioned, unless a farmer is going to put up more than 70 or 80 tons or silage he had better build one of the snowfence models. This is easily accomplished by placing a section in a circle 20 to 30 feet in diameter at the desired location. Be sure you're on level ground unless you want to build a model of the Leaning Tower. Fill the section of fence about two-thirds full with a blower or grain elevator, tramping it as much as possible, especially around the edges. Then raise the pickets about two feet and again fill it to the two-thirds mark. Continue this operation until the stack is 12 to 15 feet high. Remove the snow fence when the stack is completed.

The secret of making snowfence stacks with a minimum of spoilage is to use direct cut forage mowed at the stage at which it would make the highest quality

(*Continued on page* 84)

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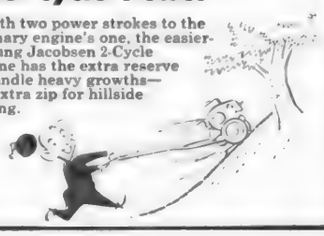

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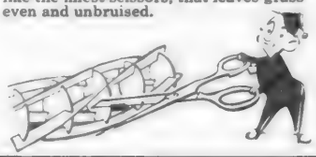

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JACOBSEN MODEL 18 ROTARY MOWER

18-inch cutting width

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DOW

THE FARM HOME

The Romance of Covered Bridges

(Page 78)

By Mary Catherine Lloyd

PICKLING TIME

The popularity of one of our oldest vegetables is still growing.

"Most people know, just naturally, what's good for them," said Mrs. James B. Nichols of Newtown, Connecticut, as she looked up from peeling a brittle, deep green cucumber. "Why, I remember my Grandmother always used to have either cucumber pickles or little sweet ones on the table for breakfast every morning. One fall she wasn't feeling so well and Mother told the Doctor she thought Grandma shouldn't eat pickles for breakfast. The Doctor's answer was short and to-the-point, 'If she has had pickles for breakfast these 92 years, then taking them away won't help. I'd say she should keep right on eating them.'"

Highway Six, between Danbury and Newtown, Connecticut, now cuts through the Nichols' farm, fairly close to the beautiful, big white frame homestead that's been in the family over 200 years. Over the farm home tower huge maple trees. The view from the high hilltop takes you far down the Hoosatonic River valley.

"Cucumber pickles," says Mrs. Nichols as her eyes sparkle, "Yes, indeed! I recall the crocks and crocks and jars and jars of pickles put up every year, when I was a girl at home. There were eight children in our family, and one or two Aunts living with us always, and never less than two hired men. It paid to put up lots of everything, with that big family.

"We raised bushels of cucumbers, and did we like them! Had them for breakfast in season. And, oh, the pickles!" continued Mrs. Nichols. "I'll give you some of our favorite recipes. Three of them were Grandmother's, and the fourth came from the minister's wife in Roxbury, where I went to church as a girl.

"I was hardly more than a girl when I met Mr. Nichols—just 17. Father thought I was too young to marry and sent me to Wheaton Seminary. Then when I married at 18, and came here to Newtown to live, Mother made a cookbook for me of the family recipes. I did the same thing for my own two girls, who both now live in Hawaii. I still put up plenty of pickles every summer. We think they add the spice you need with a meal. I learned to like pickles early in life and was taught cucumbers, fresh or pickled, were good for you."

Science today verifies the soundness of Mrs. Nichols' respect for the cucumber and pickle. At Michigan State College, Dr. F. W. Fabian, Research Professor of Bacteriology, with Dr. C. A. Hoppert, Professor of Biochemistry, conducted three years of study into the matter. Analysis of fresh cucumbers, and the different kinds of pickles made from them, were obtained to determine their value in the human diet. Pickles from every section of the United States were collected and studied.

Not only do they have health-giving and body building Vitamins A, B_1 and B_2, and a very considerable amount of the anti-scurvy C Vitamin, they furnish some essential minerals, including a notable number of milligrams of iron.

No wonder ancient mariners, as well as Caesar and his legions, considered pickles a "must" for health on sea voyages or long campaigns. And Cleopatra believed them essential for beauty's sake. Queen Elizabeth prized them as a delicacy, and so, too, did the Sixteenth Century Dutch, leading fine food fanciers of the then Western World.

In our own country, George Washington and John Adams are on record for their appreciation of pickles. Thomas Jefferson wrote, "On a hot day in Virginia, I know of nothing more comforting than a fine, spiced pickle, brought up trout-like, from the sparkling depths of that aromatic jar below stairs in Aunt Sally's cellar."

No one knows when pickles were added to the human diet, but their popularity has persisted and today is growing rapidly, a classic example of the sometimes instinctive good judgement in diet. Here in the United States pickle eating is on the increase. Cucumbers were the fourth greatest in acreage of all vegetable crops sold for processing, either freezing or canning. In acreage, corn was first, peas second, tomatoes third, then cucumbers, and fifth, snap beans.

Time was when the chief importance of the pickle patch was to contribute to the

(*Continued on page* 123)

Mrs. James B. Nichols of Newtown, Connecticut, likes to line her shelves with sweet slices of White Spineless cucumbers which her husband raises. Just to be sure to suit a variety of tastes she makes some of each of the four basic types, shown in the panel at the right. They are, from top to bottom: overnight pickles, sweet gherkins, sours and a jumbo dill.

Dishwashers

If the water and wiring systems can support one of these machines, the farm wife's meanest chore can be done automatically.

Ask any housewife which task she'd like most to be relieved of and she'll probably say "Dishwashing." Today with electricity and running water in most farm homes, the job of dishwashing may be taken over by one of the new automatic dishwashers.

Even though the price of these machines is no longer prohibitive—$225 to $375 is the price range—many a farm family has steered clear of a dishwasher because they have either underestimated their own water and wiring systems or overestimated the needs of the automatic dishwasher.

The farm wife can get her money's worth out of a dishwasher, for she prepares bigger meals for more people than the average housewife.

Contrary to general opinion dishwashers are not water hogs. They take the same amount of water, or less, than hand washing, and when compared with a clothes washer, they are downright stingy with water. For example, three to eight gallons are needed for washing and rinsing a load of dishes, while the clothes washer requires 24 to 54 gallons per load. The plumbing and wiring requirements are equally light.

Inventors, spurred on by their wives, no doubt, have worked on dishwashing machines for a long time. The first serious commercial undertaking in the dishwasher field was made in the early 1900's. A small company brought out a mechanical dishwasher that was worked by means of a hand crank. This crank operated a plunger which moved rapidly up and down inside the washtub, splashing water over the dishes. Although the machine worked reasonably well, the cranking action and the splashing noise caused many objections from housewives who preferred dishpan hands to the violent exercise required by handcranking.

Today's automatic, white-enameled machine bears little resemblance to these early "Model T" dishwashers. The farm wife can take her pick from among the models produced by seven or eight leading manufacturers, each of whom makes two or three different styles. Some machines such as the Youngstown, Apex, Westinghouse, and General Electric dishwashers feature top opening or top loading. Hotpoint, Crosley, American Kitchens, and KitchenAid dishwashers open from the front with the racks sliding out for loading the dishes. There are also dishwashers in combination with sinks, if you are in the market for both. There are self-standing models that may be placed anywhere in the kitchen and customized units which drop into cabinet space so that a counter top may be fitted over to give additional working area. There are even portable machines, such as those made by James and Westinghouse, which may be connected by hoses to the sink faucet and drain when in use and then rolled out of the way again.

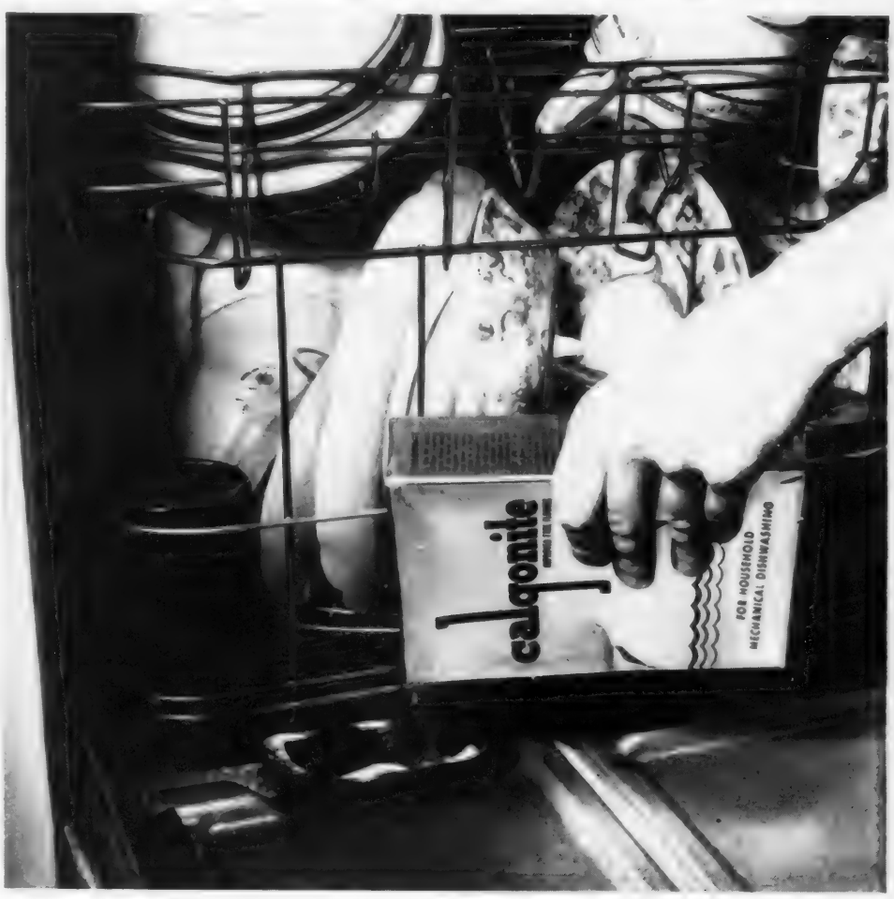
Dishwashers are heavy-gage steel cabinets, finished with baked enamel, containing a tub with two chrome or vinyl-plastic coated racks for the dishes, silver, pots and pans. The Hotpoint and Youngstown machines are 27″ wide while other standard models are 24″ wide. In combination with a sink, sink and dishwasher together are 48″ wide. Capacity is usually dinner dishes and silver for six or eight people. Portable machines may be several inches narrower and have capacity for dinner service for six.

At the bottom of the tub is a motor-driven impeller, or a spray-type nozzle, which is responsible for the water action that does the cleaning job. Turned by a ⅓ or ¼ hp. motor at the rate of over 1700 revolutions per minute the impeller circulates the water up and over the dishes, washing the detergent out of a special cup, blending it with the water. This water is then hurled over the dishes. During the drying period this impeller, with all the water drained from the tub, acts as a fan to circulate warmed air to dry the dishes.

A rust-proof screen protects the impeller, prevents the recirculation of food particles and also reduces the possibility of small items, such as silverware, being bent or broken if accidentally dropped to the bottom of the tub while the impeller is in operation.

Although there are slight variations in appearance and each manufacturer claims special characteristics for his model's mechanism, or action, essentially the operation of the automatic dishwashers is similar. The cycle, varying in length from about 10 to 45 minutes, may include a spray rinse which washes loose food from the dishes as well as clearing cooler water from the line and tempering the dishes to withstand the hotter water. The water drains and is followed by one or two wash cycles with detergent. One or two rinse periods follow this and then, depending on the model of dishwasher, the lid either pops open and the dishes flash dry in their own heat, or the impeller and heating coil continue to operate with the lid closed circulating heated air over the dishes until they are dry. The machine then stops automatically.

TO MAKE DISHES sparkle, not spot, use the least amount of detergent possible.



THE HOUSEWIFE TODAY may choose from among many styles to find the dishwasher that fits her kitchen layout. If she needs a sink as well, there are several two-in-one units like that at the left. The dishwasher above loads from the top, but slides out so extra counter space is available. Other models feature front opening and racks which roll out for front loading.

THE EARLY "MODEL T" dishwashers had to be cranked by hand. They got the dishes clean, but most women preferred dishpan hands to the violent exercise it took to do the job.

The question most people want answered is, "What must we have in the way of water-under-pressure, drainage and wiring systems to support such a machine and make it work successfully?" Since the water situation is the primary concern, let's look at that point first. The amount of water required by the dishwasher, regardless of make or model, is never more than about 8 gallons for the complete washing-rinsing cycle, but this water must be *hot*, which makes a hot water heater the first prerequisite. Experience shows that tap water of less than 150° F. has cooled so much by the time the washing actually gets under way that it does not do an entirely satisfactory cleaning job, nor does water cooler than 150° have the effective germ-killing ability, which is one of the big points in favor of washing dishes mechanically.

If your hot water heater can be regulated, then setting it up a notch should provide water at the right temperature; but the manufacturers also have built into the machines a way to provide water at the best temperature or keep the water hot when it reaches the machine. Youngstown and Apex dishwashers have built into the machine a small two or two-and-a-half gallon hot water tank which heats water to about 180° F. This water then supplements the water coming from the regular household water heater, boosting it to the right temperature.

The other machines have a heating rod at the bottom of the dishwasher which circles the impeller. As soon as the machine is turned on, the heating coil starts operating maintaining a high water temperature as the water flows into the machine.

"When we remodeled our house three years ago," says Mrs. Owen Douglas who lives on a dairy farm near Rising Sun, Indiana, "I decided that I was going to leave space for a dishwasher. A lot of my friends thought I might be making a mistake, because they had heard that automatic equipment takes so much hot water, but I turned a deaf ear and went right ahead. I didn't see how it could possibly take more water than washing and rinsing by hand.

"We have a deep well system which supplies all our water in and around the house and a 30-gallon gas water heater which we have been using for years now. Together they still turn out plenty of hot water, even with the dishwasher added. The water is about average hardness, I'd say—at least we've never felt that we needed to add a softener to the system. The only spotting I've ever noticed has been on my glassware and silver. If I want this to be especially bright, then I can dry it by hand when the lid opens after the washing and rinsing cycles end.

"There was the question, too," Mrs. Douglas says, "as to whether or not a dishwasher would upset our septic tank. No matter what anyone says," she adds, "I think all septic tanks have to be cleaned out every so often, and the dishwasher has not made this job any different than it has always been.

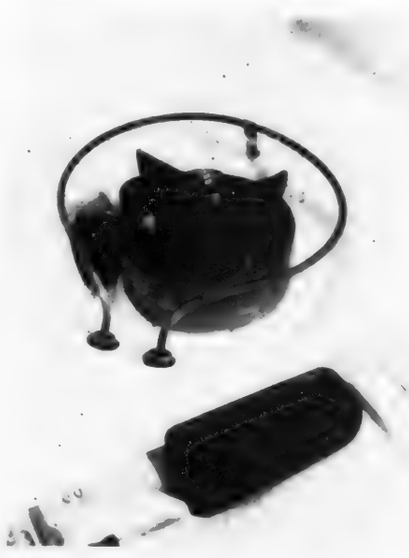
"The remodeling job gave us a chance to install several extra circuits in the house, but when it came time to hook up the dishwasher to the system, the kitchen lighting circuit had plenty of room on it for the dishwasher, so we added it to

MOST FARM water systems deliver 20-40 P.S.I. pressure, enough for dishwashers.

DISHWASHERS USE little water, but it must be hot to do a good cleaning job.

Brand	*Type*	*Width*	*Capacity*	*Total Time of Cycle*	*Water per Load*	*Water Temperature Recommended*	*Water Pres. Recommended*	*Electrical Requirements*
American Kitchens	Front opening, front loading, sliding racks, heating rod.	24″ alone, 48″ with sink	Family service for 8	34 min.	6.4 gals.	140°-160° F. at dishwasher	20-120 P. S. I. (Pounds per square inch)	Operates on 110 volts 60 cycle AC circuit.
Apex	Top opening, top loading, booster heater.	24″ alone, 48″ with sink	Service for 6	30 min. maximum, can be reduced	3 gals.	Standard heater should deliver at 125°-135° F. Booster heater supplies water at 180° F.	20-100 P. S. I.	Operates on 110-120 volts 60 cycle AC circuit.
Crosley	Front opening, sliding racks, front loading, heating rod.	24″ alone, 48″ with sink	Service for 6	34 min.	6.3 gals.	140°-160° F. at dishwasher	20-120 P. S. I.	Operates on 115 volts 60 cycles AC circuit.
General Electric	Slides out, top loading, heating rod, portable avail.	24″ alone, 48″ with sink	Family service for 8 people	30 min.	7 gals.	150° F. at dishwasher	20-120 P. S. I.	Operates on 115 volts 60 cycle AC circuit.
Hotpoint	Front opening, sliding rack, front loading, heating rod.	27″ alone, 48″ with sink	Service for 8	45 min.	8 gals.	150° F. at dishwasher	20-120 P. S. I.	Operates on 115 volts 60 cycle AC circuit.
James	Portable, top opening, top loading, heating rod.	25″ wide, 18″ deep	68 pieces	9½ min. Dishes are self-drying	4½ gals.	Heating element heats water to 180° F. for last rinse	Pressure switch controls water level	Operates on 110-120 volts 60 cycle AC circuit.
KitchenAid	Front opening, sliding rack, front loading, heating rod.	24″ alone, 48″ with sink	Service for 6-8	35 min.	7 gals.	140°-160° F. at dishwasher	Not less than 15 P. S. I.	Operates on 115 volts 60 cycle AC circuit.
Westinghouse	Slides out, top loading, heating rod, portable avail.	24″ alone, 48″ with sink	Service for 8	36 min.	7 gals.	140°-160° F. at dishwasher	20-120 P. S. I.	Operates on 110-120 volts 60 cycle AC circuit.
Youngstown	Top opening, top loading, booster heater.	27″ alone, 48″ with sink	Service for 8	9¾ min. Dishes are self-drying	5½ gals.	Standard heater should deliver at 125°-135° F. Booster heater supplies water at 175° F.	20-125 P. S. I.	Operates on 110-120 volts 60 cycle AC circuit.

VITAL STATISTICS on dishwashers produced by leading manufacturers are listed above. The impeller below, typical of that in many of the machines, hurls water over the dishes during washing-rinsing cycles. The heating rod circling it boosts water to germ-killing temperatures.



that circuit instead of to one of its own."

Although some automatic equipment has a reputation for being pretty delicately adjusted and easily thrown out of balance, Mrs. Douglas says that she has had only one adjustment made in three years on her dishwasher. The cut-off switch was not operating properly, but was quickly and easily set right by the serviceman who came out from Rising Sun.

Water pressure also plays an important part in the operation of the machine, although the wide range of pressures under which the dishwasher will serve satisfactorily usually gives plenty of leeway. Most of the dishwashers are regulated to operate under water pressure between 20 and 120 pounds per square inch. If the pressure is greater than this, a reducing valve must be installed to prevent too much water from entering the dishwashing tub. This causes an overflow through the standpipe and also may increase the load on the motor, through the extra load placed on the impeller—enough to blow the fuse. Abnormally low pressure results in too little water in the tub which reduces the effectiveness of the washing action. Most farm water systems are set to supply water between 20 and 40 pounds pressure which will work efficiently.

Mineral content of local water supplies does affect the washing performance of any dishwasher, manufacturers admit, just as it affects the washing ability of the home laundry and housekeeping efficiency in general; however, the new detergents are doing an effective job of practically eliminating washing difficulties in most areas where the water is moderately hard.

Several special dishwasher detergents, such as Electra-Sol, Calgonite, Finish, and Chat may be recommended for use with the machines. These are available usually at the local grocery store or through the dishwasher dealer. The recommendations on the box give the quantity which produces effective dishwashing under normal circumstances, but this quantity must vary depending upon mineral content of water in various areas. One good rule to remember is always to use the least amount of detergent which gives satisfactory washing results.

(*Continued on page* 119)

KISSIN' BRIDGES

By Josephine Leonide Hewitt

When it came to a pretty girl, Grandpa was the shyest young man in the county and chances are he'd never have gotten to the "poppin' point" with Miss Sally if it hadn't been for the Kissin' Bridge.

One Sunday early in June, the story goes, he was driving Miss Sally home from Services when one of those sudden summer showers came pelting down just as they were nearing Deer Run. For the sake of Miss Sally's new sprigged muslin dress, Grandpa flicked the whip at his bay mare and made a dash for the shelter of the bridge which spanned the stream. At the sudden speed, Miss Sally gave a little shriek and grabbed the side of the buggy with one hand and her bonnet with the other. They whizzed aróund the bend at a reckless clip, clattered onto the boards, and drew up in the cool darkness of the old bridge.

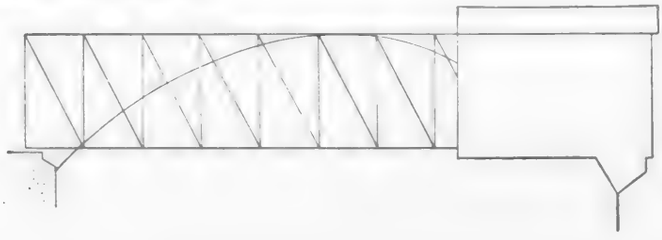
The fragrance of the fresh rain mingled with that of the early summer flowers and the musty, dusty smell of the old bridge. Miss Sally, all breathless and flushed from the wild ride, smoothed her dress, settled her bonnet and laughingly declared that Grandpa was a regular dare-devil!

This, with the noise of the rain pounding down and the dimness of the old bridge, boosted Grandpa's courage and before stopping to think about being shy he had slipped an arm around Miss Sally and kissed her. By the time the rain stopped a few minutes later, she had promised to marry him.

The old kissin' bridge that sheltered Grandpa that summer Sunday, and the 1500 others that still exist today, are links that bind us to an earlier, simpler way of life. Many have given way to fire, flood, time, and modern traffic, but those that do remain are distinctly early American—severely simple, straight-forward, and functional structures that possess little intrinsic beauty. If they were stripped of their surroundings and set between the treeless banks of a river, they would look, as one farmer said, as though they were built by the mile and sold by the yard. In their days of greatest usefulness, however, they harmonized with the rural scene as naturally as the log cabin.

While carrying a road across a river was the chief purpose of the bridge, it served a good many other uses which have endowed it with the power to set people daydreaming about the past. The

Burr Truss and Arch



Town Lattice Truss

Burr's truss, strengthened with an arch, was used for the majority of covered bridges in the U. S. The lattice system was popular in New England.

trout fisherman cherished the long still pool under the bridges and the bird lovers knew that robins, phoebes and even swallows picked its weathered timbers for nesting. To small boys, the bridges offered infinite possibilities for amusement—a swim underneath, or chinning and hand-over-hand on the rods and braces overhead.

Some families kept a "shoe rag" tucked between the timbers of a bridge which was near their church so that they could dust off their shoes before making an entrance at Sunday Services. The long rough floor made an ideal place for drilling the local militia. In an emergency it was used for campmeetings, the long tunnel echoing with the jubilant singing of an old-time hymn.

The walls inside the bridge were a favorite spot for traveling salesmen to post signs extolling the miraculous cures offered by Perry's Spavin Cure or Flanagan's Liniment (For Man or Beast).

And many a boy has been late to school because he lingered too long in the bridge enthralled by the circus poster showing a beautiful creature in pink tights balancing herself on the back of a plumed white horse which raced around the ring as a mustachioed man snapped his whip.

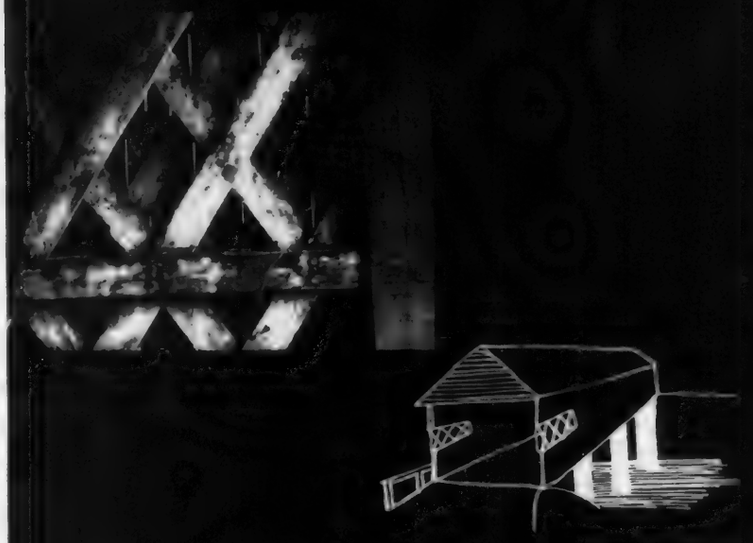
The covered bridge, far from being an American monopoly, has been in existence for centuries. The first covered bridge spanned the Euphrates River in 783 B. C. and there are covered bridges in China which date back 2000 years. The famous Chapel Bridge in Luzerne, Switzerland, which has murals painted inside, was built in 1333. The Ponte Sul Tincino in Italy is also a 14th century product.

When bidding for a bridge contract came up, the competing builders would arrive carrying models of their bridges, since there was little planning of the bridges on paper and blueprints were unknown. There was always some haggling over price and materials. Once the selectmen awarded the contract, however, their only specification usually was that the new bridge be a "load of hay wide and high," which gave the builder considerable leeway.

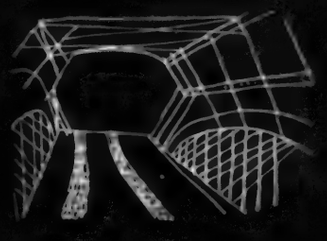
The contractors were generally fussy about the timber used in their bridges. Native pine was much used in the Northeast, but it was less durable to the spray and general dampness. Hemlock and spruce were also favorite timbers. Whatever the timber used, it had to be good clear stuff, thoroughly air seasoned before it went into use. Even so it was cheap and the cost of the bridges by today's standards was very low.

One bridge built in 1796 near Hanover, New York, required

(*Continued on page* 80)



COVERED bridge-building was the work of master-craftsmen rather than engineers. The hand-hewn timbers were fitted together in a clearing near the bridge site, then transferred to the piers where they were put together again with wooden nails. No two bridges were alike.



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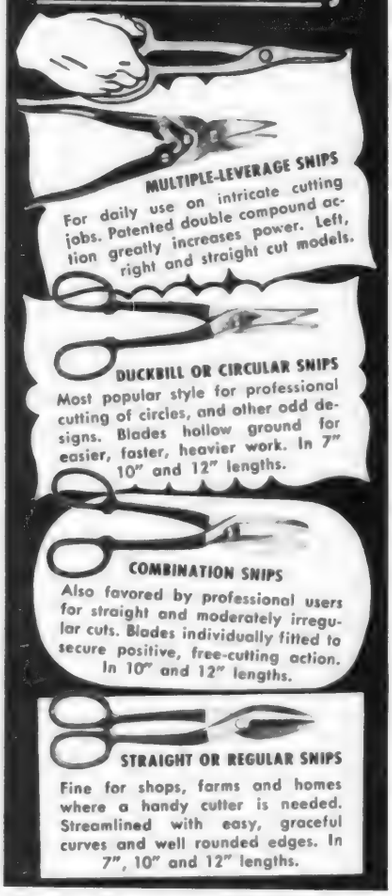

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KISSIN' BRIDGES

(*Continued from page 79*)

20 pines, each 60 feet long and hewn 18 inches square. The Deacon Dewey who supplied these timbers cut and hewn to order charged $1 each for them. The Cheapside Bridge, Dearfield, Massachusetts, which was an impressive two-span bridge with a partition in the center dividing north-bound and south-bound traffic, cost but $8000 in 1806. During its first 22 years, it earned $18,000 in tolls.

When a bridge was contracted and the site agreed upon, a nearby field or other clear place became the "proving grounds" for the bridge before it was erected on the piers. There the timbers of the bridge were fitted together on the ground, then taken apart and each piece put up separately in its place by means of a scaffolding of timber.

In building the bridges the exact design of a truss, or frame, was rarely followed. The builder considered the materials and the situation under which the bridge was to serve, and then varied the design to suit. A sample panel of the frame was laid out carefully by the master builder, who was so concerned with accuracy that he marked the joints with a sharp knife blade because a pencil made too coarse a line. The patterns were then copied from the sample with great precision to be used by the men in cutting the joints. Any considerable error in making the joints meant too much settlement or sag when the scaffolding was taken away.

The great truss timbers were carefully arranged on the grass and leveled. Holes were bored with big augers to receive the wooden pins which connected the parts. These treenails, or trunnels, as they were called, were usually made of oak and were soaked or boiled in oil to assure durability before they were used.

While this work was going on, scaffolding was erected in the stream between the waiting abutments and "stringers," or horizontal timbers, were laid from bank to bank. These were never level, but always with a "camber" so that the midstream part was several inches higher than the ends. This camber was one of the builder's evidences of skill and had two uses. Bridges always settled a little when the scaffolding was removed and the vibration of traffic caused more settling as time went by. The lesser reason has to do with the error made by the human eye which sees a long level line as if it curved down in the middle. The camber corrected this.

Several men of the first half of the 19th century were professional bridge-builders—Timothy Palmer, Louis Wernwag, Theodore Burr and Nicholas Powers. Others such as Colonel Enoch Hale and Ithiel Town, while not exclusively builders, made a contribution to the science of engineering bridges.

Colonel Hale became prominant in local and county politics in New Hamp-

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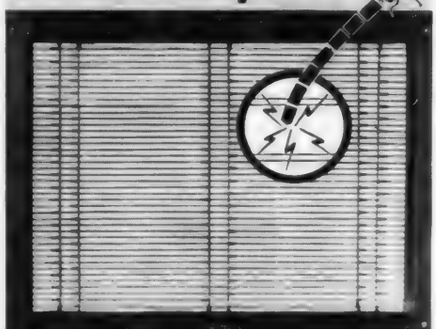
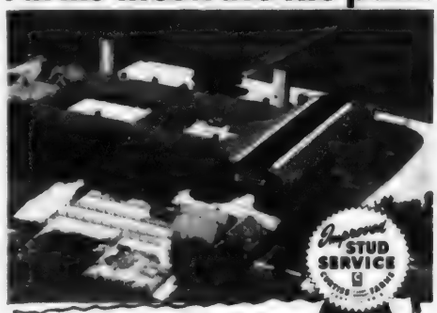


Gardner Low Cost Electrified Screens

Curtiss Candy Breeding Farms illustrate the point



Curtiss IMproved Stud Service

The home of the foundation herds of Holstein, Guernsey, Brown Swiss, Ayrshires, Jersey, Milking Shorthorns, Aberdeen-Angus, and Scotch Shorthorns producing the sires used in the nationwide IMproved Stud Service.
Cary, Illinois

BY PLACING Gardner electrified screens over strategic windows and on entrance doors, pesky flies that bedevil stock and contaminate, can all but be eliminated. These durable screens operate twenty-four hours a day in all kinds of weather for a current cost of a few pennies per month. They will deliver years of safe, trouble-free service. Curtiss Candy Breeding Farms, along with many other outstanding establishments, have been Gardner equipped since 1943 without any replacement required. Initial cost is comparable to what you would spend in one year to combat flies by other methods. Gardner engineers will gladly prepare recommendations for your needs — without obligation. Write today for full information.

Gardner Manufacturing Co.
3652 Barstow St., Horicon, Wis.

WOODEN CORN CRIBS DO COST LESS *AT FIRST*

BUT THE CORN AND GRAIN WASTED THROUGH EXPOSURE, POOR VENTILATION, AND RATS, AND THE COST OF MATERIALS FOR REPAIRS OR REBUILDING EVERY FEW YEARS, MAKE A WOODEN CRIB MORE EXPENSIVE THAN A BUCKEYE STEEL CORN CRIB, WHICH PROVIDES THE BEST ALL-ROUND PROTECTION ON THE FARM FOR YOUR CORN.

Inferior farm structures of a more-or-less temporary nature add very little to the total value of a farm, and sometimes lessen the sale value.

WHY WOODEN, WIRE MESH, AND MAKESHIFT CRIBS COST YOU MORE IN THE LONG RUN

- EXPOSURE TO PROLONGED DAMPNESS BRINGS ON SPOILAGE.
- RATS CAN GET AT THE CORN AND EAT THE BEST PART.
- NOT ENOUGH VENTILATION THROUGH THE CORN — CORN MOLDS OR ROTS.
- WOODEN CRIBS REQUIRE A GREAT DEAL OF MAINTENANCE — NEED TO BE REPAIRED OR REPLACED TOO OFTEN.
- WEEVILS LAY THEIR EGGS IN WOOD.

Advantages

OF BUCKEYE STEEL CORN CRIBS

For all weather — Forced Air* or Gravity — Buckeye provides best protection for storing corn on the farm.**

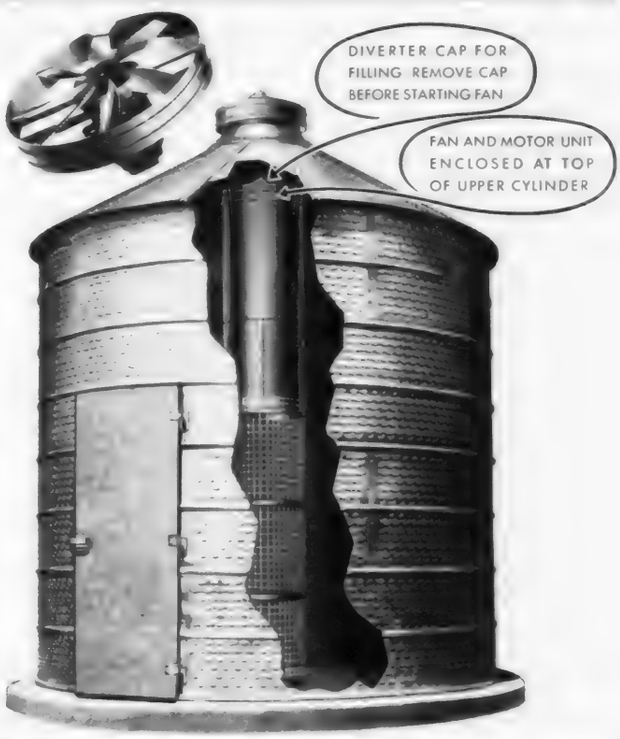
Heavy 22-gauge, galvanized steel, either forced air or gravity system — to "keep" corn in the crib until ready for use. Buckeye Steel Cribs have a center ventilating tube with a strong wire mesh opening ⅔ way up the tube and a galvanized section at top which holds motor and fan. Motor is totally enclosed and operates on 110 or 220 volts.

Buckeye Corn Cribs are perforated for proper ventilation, designed to prevent rodent entry, and are of Zincgrip steel — galvanized plus extra coating of zinc. Zincgrip steel provides assurance of lifetime storage facilities. When corn with a moisture content of more than 23% is put in a crib, a forced air system is necessary for successful storage. If the moisture content drops below 23%, the gravity air system will be sufficient, which means that the fan can be turned off.

Buckeye Steel Cribs are long lasting — rat proof — rust resistant — weatherproof — lightning proof — fireproof — easily erected — require little maintenance — properly ventilated — fan in center shaft circulates air so efficiently that drying to 15% moisture occurs in a short time. Unusual perforations on walls let air in and keep rain out.

ALL PARTS SIZED TO HANDLE EASILY AND MATCH ACCURATELY — MADE FROM HEAVY, 22-GAUGE GALVANIZED STEEL

ATTRACTIVE BUILDINGS OF A PERMANENT NATURE INCREASE THE SALE VALUE OF YOUR FARM



Buckeye Steel Grain Bins have the same construction as Buckeye Corn Cribs, except that the walls are solid steel sheets. Give your grains superior protection with Buckeye Steel Grain Bins.

See your Silver Shield and Buckeye Dealer, or distributor, or write for more information.

* Forced air ventilation sizes 295 to 875 bushels of ear corn.

** Gravity sizes 295 bushels to 1275 bushels of ear corn. Recommended where moisture content of corn is under 23% for safe, economical storage.

CLAYTON & LAMBERT MFG. CO.
1704 DIXIE HIGHWAY • LOUISVILLE, KY.

Please send me more information on Buckeye Steel Corn Cribs and Grain Bins

NAME: .....

ADDRESS: .....

ALSO MANUFACTURERS OF SILVER SHIELD STEEL SILOS

Be your own Weatherman

with RAIN BIRD SPRINKLERS

Plenty of water WHERE you need it, WHEN you need it!

Save water, save labor, save crops with Rain Bird Sprinklers, famous around the world for their faultless operation, even distribution of water. You'll find increased production at lower cost when you irrigate with Rain Bird.

There's a Rain Bird Sprinkler to fit every irrigation problem—19 models in all, ranging in size from 1½ G.P.M. at 3 pounds pressure to 610 G.P.M. at 120 pounds pressure.

If yours is a special irrigation problem, consult our research department now. There's no obligation, of course.

NATIONAL RAIN BIRD SALES & ENGINEERING CORP.
AZUSA, CALIFORNIA

L. R. Nelson Mfg. Co., Inc., Peoria, Ill. • RAIN BIRD Sprinkler Mfg. Co. (Canada) Ltd., Vancouver, B.C.

POWER

to heat . . . to penetrate . . . to dry

Unique heat exchanger design makes this drier compact, yet efficient. Maximum radiation surface for maximum economy. Add this to the specially designed Hartzell axial flow fan — it forces heat vigorously through a batch drier, mow or bin — and you have

Power . . . to heat . . . to penetrate . . . to dry

The Hartzell drier will give you *useful, economical, trouble-free* service. Easy to operate, automatically controlled.

Available in 3, 5 or 7½ HP sizes; priced complete; nothing extra to buy.

Free engineering service. Write for folder, or contact your dealer.

HARTZELL propeller fan co.
Div. of Castle Hills Corp.

DEPT. F. • AGRICULTURAL DIVISION • PIQUA, OHIO

shire and, like many a politician before and after him, introduced into the legislature a bill which would grant him permission to erect a toll bridge over the river between Walpole, N. H., and Rockingham, Vt. The bridge, built in 1785 was the first to span the Connecticut River.

The tolls charged to cross the bridges were a favorite topic for complaint. Three cents per horse, one cent for sheep or hogs and 10 cents for horse and buggy was entirely too much to pay! But to the individual who was willing to risk his money and reputation for such an uncertain venture as bridging a stream where the heads of a township would not, it was perhaps only fair that he should be given the opportunity of getting his money back by charging a toll to cross the bridge.

There is the story told by a traveler in Vermont during a flood of the Connecticut River at the turn of the century. "I arrived in town," he said, "and decided to take the mail stage across the covered toll bridge there, but because the river was rising vehicles were not permitted to cross. So I joined the stage driver and decided to walk across the bridge with him. At the toll gate on the other side the toll keeper was thrown into a dilemma as to whether or not I was on the stage.

"I was with the stage driver, he pointed out, and was therefore a passenger and entitled to pass over the bridge free. On the other hand, he pondered, I was not actually in the stage, but walking, and as a pedestrian I should pay 3 cents. After a three-sided discussion of the situation, however, the toll collector declared that I was in reality a passenger, walking not of my own choice but by act of God. So I kept my 3 cents and went on my way, wondering what sort of decision the Supreme Court would have handed down in the matter!"

One of the most noted and ingenious of the pioneer bridgebuilders was Timothy Palmer who built many of the larger bridges of the Northeast. Best known of his work was the "Permanent" Bridge over the Schuykill River at Philadelphia. It is believed by some to be the first covered bridge built in America and had an overall length of about 1300 feet.

It must have been this bridge which a farmer approached one day with a load of hay. Taking one look at the long dark tunnel, he clucked to his team, turned around, and drove back the way he came. "I could have gotten in all right," he mused, "but I'd never squeeze through that little hole at the other end."

Theodore Burr, a relative of Aaron Burr, is credited by most engineering authorities with discovering the principle that solved the problem of creating a covered bridge. In 1798 he first used this principle to build a bridge and his design was used after that for the majority of wooden covered bridges in the United States.

His truss was in reality merely a series

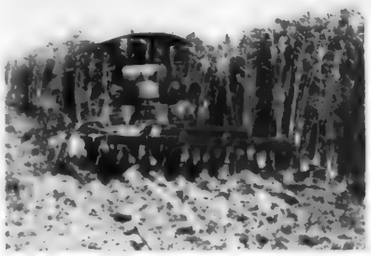
of King posts combined with an arch, but instead of strengthening the arch by the truss, he strengthened the truss by the arch. To understand his design, suppose that the longest available timbers are used for the diagonals slanting from the ground base to the top of the King post. It will readily be seen that the two bases of the right triangle together will reach farther than either diagonal—that is, than any available timber. The arch was then added to strengthen the overall structure.

A popular truss system of early New England was the lattice truss which was patented by a business man, Ithiel Town of Connecticut, in 1820. Town spent a great deal of time promoting the merits of the truss through advertising, pamphlets and travel.

The lattice truss was a true truss, free of arch action and horizontal thrust. In its favor could be said that it was easy to build, stood much abuse, and gave evidence of distress long before it collapsed.

Nicholas Powers was one of the builders who specialized in the lattice truss. His best known bridge at North Blenheim, New York, was extremely long for a single span bridge and was looked upon with many a lifted eyebrow as "Power's Folly." As the time drew near to knock the scaffolding out, Power's climbed on the bridge and called to the crowd who had gathered below, presumably to see the bridge come crashing down, "If she goes, I'll go with her!"

No Soil Is Too Tough!



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Virgin brushland, sun-baked adobe fields, heavy packed sod . . . these are jobs for Towner's Stubble Plow. Three tons of weight assure penetration of even the toughest land.

Write for your free copy of descriptive literature.

TOWNER MANUFACTURING CO.
Santa Ana, California
Since 1915

Hot Chicks Cost You Money!

Tests show, and poultry growers agree, that chickens lay more and larger eggs—reach market weight sooner—produce greater profits when housed in a temperature of approximately 70°. Normal summer temperatures of from 85-90° actually cause a sharp reduction in egg size, a drop in food consumption and a drastic loss in egg *production*. Near 100°, a large weight loss is recorded, and mortality rises at a staggering rate.

To combat this, farmers everywhere are turning to Alcoa Aluminum Roofing for range shelters and poultry houses. When the hot summer sun threatens a year's profits, they rely on aluminum's ability to keep buildings as much as 15° cooler than outside temperature. Those 15° can mean the difference between full production and financial loss.

Lightweight Alcoa Aluminum Roofing goes up fast and requires no painting. Just put it up . . . and forget it! Plan your new poultry house with aluminum. You can have a full set of working drawings, plus a list of necessary materials, for just 50 cents and the coupon below. They show you simply, easily, just how to build a 200-bird house of long-lasting Alcoa Aluminum.

DRAWINGS for a 200-BIRD ALCOA ALUMINUM POULTRY HOUSE 50¢

ALUMINUM COMPANY OF AMERICA
2114-F Alcoa Building, Pittsburgh 19, Pa.

Please send me the plans for a 200-bird Alcoa Aluminum Poultry House. I'm enclosing 50 cents to cover the cost of mailing and handling.

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Alcoa Aluminum

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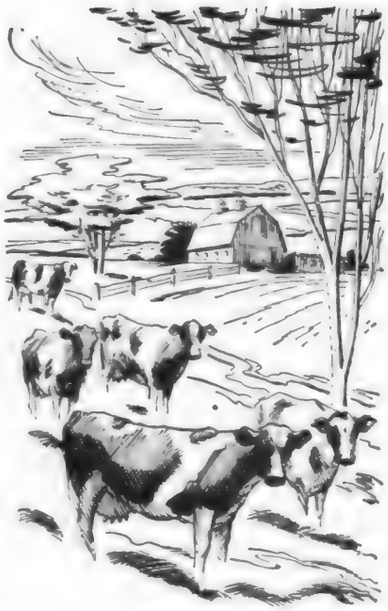
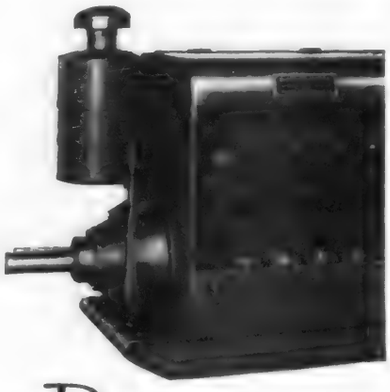


Purebreds!



PURE bred stock . . . high yield seed strains . . . perfectly kept buildings and equipment . . . all are the mark of the farmer who realizes that only from quality can be derived the most in profits and surety of investment.

And here's quality *diesel* power —the Fairbanks-Morse Diesel Model 49! It's built to the same exacting standards that have produced over ten million diesel horsepower stamped with the name—Fairbanks-Morse.

Be sure of dependable POWER with Fairbanks-Morse Diesels! Fairbanks, Morse & Co., Chicago 5, Illinois.

FAIRBANKS-MORSE

a name worth remembering when you want the best

DIESEL AND DUAL FUEL ENGINES • RAIL CARS • DIESEL LOCOMOTIVES • ELECTRICAL MACHINERY PUMPS • SCALES • WATER SERVICE EQUIPMENT • FARM MACHINERY • MAGNETOS

Such confidence inspired others to stay on the bridge, but there was still skepticism by those who believed that the bridge would sag so much from its own weight that it could not possibly bear traffic. To this Powers shouted, "If she sags an inch, I'll jump off!"

Without further delay the scaffolding was removed and, fortunately for Powers, the bridge settled only a small fraction of an inch, less than he had allowed for in his planning.

As the years passed, signs of decay caused the removal of more and more of the old spans, but the covered bridge enthusiasts who dot the nation have organized the American Covered Bridge Historical Society at Muncie, Indiana, and the Society for the Preservation of Covered Bridges in Boston, Massachusetts, to help in preserving the covered bridges still standing and to perpetuate covered bridge lore and legend.

Even in this jet age, they know it is still a thrill to round a bend and glimpse the high roof, the broad, weathered planks, and the quiet darkness within where generations of neighbors have passed the time of day, small boys have played away a rainy afternoon, and many a horse has patiently waited while a bashful swain stole a kiss before driving out into the sunshine on the other side.

STACK SILOS

(*Continued from page* 69)

hay. Since you cannot pack properly by foot you must rely on the weight of the material itself to help do the packing. If forage is too mature or wilted too long the spoilage in this type of storage can run 40%. When properly made the spoilage can be held to 10% to 12%.

Feeding

Disciples of the stack silage school have a slogan—"Make it and feed it from the tractor seat." That's just another way of saying that power handling in the feeding operation is a big advantage. Hand feeding out of a stack is a rough chore.

So the man who plans to put up a stack of silage had better figure in advance just how and where he is going to feed it. Orleton's self-feeding operation, explained above, is excellent for stock cattle. Variations on this are the use of wooden gates or bunk gates mounted on wheels that can be adjusted to permit the cattle to eat the silage at a controlled rate. Even in a self-feeding system it is sometimes necessary to fork out the more solidly packed material.

Some dairymen have found that their cows can be fed in bunks in the barn lot in only about a quarter of the time it would take to feed them inside if the silage is scooped up with a tractor loader and dumped into the bunks. Some provision, of course, must be made for licking the mud in the lot. Concrete paving is perfect, but a heavy layer of crushed rock

Are you getting the most from your Farm?

Are the latest scientific and practical ideas being used on your farm—to produce maximum returns, yet conserve the resources for the future? Experienced Farm Managers consider this the first essential in planning a farm operation.

A trained Rural Appraiser can give you a detailed, written appraisal showing present value and long range possibilities.

Without obligation, write for full information and list of professional Farm Managers or Rural Appraisers for your area.

H. E. Stalcup, Secy.-Treas.
American Society of Farm Managers and Rural Appraisers
Box 67, Storm Lake, Iowa

STOP Costly BELT SLIPPAGE
ON TRACTOR PULLEY JOBS
WITH PULMORE
LIQUID BELT TREATMENT

When the belt from your tractor to feed grinder, corn shredder, saw, grain elevator or other stationary farm implement *slips*, it not only takes you longer to do the job but it costs you money in wasted power and extra wear on your belt and equipment.

PULMORE Liquid Belt Treatment stops costly belt slippage; water-proofs, weather-proofs and acid-proofs belts, tarpaulins, boots and other articles. Economical.

Ask your dealer for PULMORE today; Write for circular!

BELTRACTION COMPANY
1819 West Winona St., Chicago 40, Ill.

DIG HOLES SITTING DOWN

Big Farm Production Ahead

The Danuser Digger is a time and labor saver, used in drilling holes for fence posts, foundations, seedling setting, transplanting, etc. Augers from 4" to 24" available. Thousands in use the world over. Write for literature pertaining to your model tractor.

DANUSER MACHINE CO.
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DANUSER DIGGER

Model 80 wire-tie—If you store or ship hay, bale straw for the commercial market, or just plain like wire-tied bales, see the "80". It packages up to 100 tons a day. Exclusive twist lies flat on the bale.

Model 77 twine-tie—the baler you'll see on more farms than any other make. Packages up to 10 tons of hay an hour . . . ties thousands of bales without a miss. It's the favorite of custom operators and farmers who must have highest baling capacity and complete reliability.

Now you can choose from

3 great New Holland balers!

The *sensational* Model 66 twine-tie Newest addition to a famous line... Costs hundreds of dollars less—makes hay baling practical on almost any farm!

Now, no matter what you bale or where you bale it . . . no matter whether you feed, sell or custom bale . . . you can pick a New Holland to fit *your* job. For New Holland's "66" now joins the famous "77" twine-tie and the mighty "80" wire-tie.

This gives you a complete choice of balers—priced from $1665!*

In price, size, the compact "66" beats all other self-powered, square-bale, pick-up balers . . . and will package up to 6 bales a minute, up to *7 tons of hay an hour!*

With speed like this you can bale all your hay just at the right stage of curing. Your stock gets up to 50% higher feed value . . . you keep more of your farm profits.

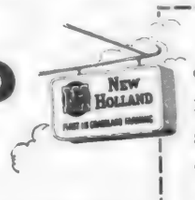
Ask your authorized New Holland Dealer to demonstrate, on your own farm, any one of the 3 great New Holland balers. Or mail coupon. The New Holland Machine Company, a subsidiary of The Sperry Corporation.

*Suggested list price F.O.B. New Holland, Pa., for Model 66, not including Federal Excise Tax on tubes and tires.

Get what you pay for—buy the best! New Holland is the only Twine certified by the U. S. Testing Co. to meet rigid standards of length, quality and strength. For wire, choose New Holland, too.

NEW HOLLAND

"First in Grassland Farming"



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Free Catalog Illustrated catalogs give complete details. Write: New Holland Machine Company, 906 Cedar St., New Holland, Pa.

Name_____

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Check Model interested in: ☐ Model 66 ☐ Model 77
☐ Model 80. I would like free demonstration on my farm. ☐

BEATING THE LIVESTOCK PRICE SQUEEZE

by **AMOS KIRBY**

expert whose advice is welcomed by farmers within range of Radio Station WCAU, Philadelphia.

LOW PRICES for livestock on one hand and high feed prices on the other make early pasture welcome. But there are two things to remember:

First, even lushest-looking grass may be short in trace minerals essential to livestock health and production.

Second, livestock on pasture require more salt than while in winter quarters when they get prepared feed containing 1% salt as a general rule.

Make sure that *your* farm animals get all the salt and trace minerals needed by keeping STERLING *Trace-Mineral* BLUSALT before them at all times.

Blusalt provides the salt they must have for the digestion of protein, carbohydrates and fats plus these trace minerals: **Cobalt**—essential for Vitamin B_{12}—guards against loss of appetite, permits maximum body gains and helps maintain normal level of hemoglobin in the blood. **Manganese**—for successful growth, reproduction, lactation and bone development. **Iodine**—to help prevent simple goiter. **Iron**—essential as part of the hemoglobin to every organ and tissue of the body. **Copper**—necessary with iron for hemoglobin formation. **Zinc**—growth producing and a part of enzymes.

Feed STERLING *Trace-Mineral* BLUSALT

100-lb. bags
50-lb. blocks
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For details, send coupon below today.

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Scranton 2, Pa.

☐ Please send me the name of my nearest authorized Blusalt dealer.
☐ Please send me free literature on Blusalt.

Name _____

RFD or Street _____

Town _____

State _____

or corn cobs will do an efficient job of keeping those udders out of the mess.

There is no reason why power handling isn't feasible in a loafing barn if the tractor can be maneuvered around the posts. In order to save bedding, though, provision should be made to keep the feeding area separate from the resting area.

Dollars and Cents

Finally there is the simple dollars and cents approach to this thing.

N. S. Hadley, one of Purdue University's staff of agricultural economists, along with other members of the department, has been barnstorming the state of Indiana the past year observing farmer experiences and, in turn, passing on the best ideas to others.

"My object," he says, "has been to try to find how farmers handle roughages as fast, as cheaply and with as little discomfort as possible."

Here's how it figures out: Purdue records show that it costs about $11.29 to grow, harvest, store and feed a ton of chopped field cured hay in the barn. A ton of baled hay will cost around $10.79 in the barn and three tons of grass silage (the equivalent of one ton of hay) in an upright silo cost $14.37.

By storing the hay outside its cost can be reduced to about $9 a ton, either chopped or baled, and in a stack the three tons of silage will cost only $10 to $11. Silage costs are always higher than hay because of the additional weight that must be handled.

On the quality side consider these figures from the Beltsville Station of the Department of Agriculture showing the percentage of feeding value of roughages in various forms that gets to the consuming animal:

Roughage	% Total Nutrients	% Protein	% Carotene
Field Cured Hay (rained on)	60	50	0
Field Cured Hay (no rain)	75	70	3
Barn Dried Hay (without heat)	80	75	7
Grass Silage (wilted)	83	83	19
Dehydrated Hay . . .	92	82	23

Since dehydrating is a process that is at present out of the question for the ordinary farmer, silage seems to be the form in which he can get the most out of his grass. And the stack looks like a cheap way to make silage.

When it comes to taxes, too, stack silos may prove a saving. George Carnot, a Wisconsin dairyman, says: "The tax appraiser can't get me for a disappearing stack, can he?"

Pros and Cons

That's the story up to now on stack silos. Where they fit into your plan depends upon your evaluation of their advantages and disadvantages as compared to the conventional upright silo.

On the credit side the advantages listed by the Purdue fieldmen are:

More thorough
INOCULATION for all your LEGUMES

The LEGUME-AID package is appreciably larger than others in size and contains more of the bacteria-carrying humus. This extra amount of inoculant makes it easier to treat your seeds more thoroughly at planting time.

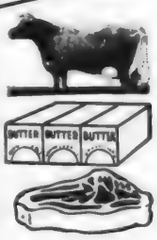
LEGUME-AID

Whether planting clover, alfalfa, lespedeza, peas, beans, lupines or any other legume, it pays to assure maximum nitrogen fixing power by treating seeds with the famous "Inoculant in the Carton." LEGUME-AID is neither sticky nor gummy. It pours freely, clings to seeds closely, yet never clogs the drill. Ask your seed dealer, or write us direct.

AGRI-LAB-INC

AGRICULTURAL LABORATORIES, Inc.
1310 Chesapeake Avenue Columbus 16, Ohio

MORE PROFITS under AVERAGE FARM CONDITIONS with TRULY DUAL PURPOSE MILKING SHORTHORNS
BEST in EVERY WEIGH



Under average farming conditions, Milking Shorthorns will give more profit because they convert home-grown feeds and roughage into meat, milk and butterfat most economically. A Milking Shorthorn holds highest butterfat record in world--also highest records on twice-a-day milking! Milking Shorthorns are BIG . . . have capacious deep body and mammary development of dairy cattle. Their TWO-WAY bargaining value plus greater salability of calves means greater farm security under uncertain world conditions. Get FREE facts or subscribe to Milking Shorthorn Journal. 6 months, $1.00; $2.00 per yr.; 3 yrs. $5.00.

AMERICAN MILKING SHORTHORN SOCIETY
313-FQ So. Glenstone Springfield, Mo.

NEW Land Clearing Tools Remove Trees, Brush F-A-S-T

The proven best and cheapest method of clearing trees up to 12" base diameter and all brush is with the Johnson GRUBBING TONGS. ALL TREES — Maple, Beech, Locust, Willow, Sycamore, Oak, Spruce, Hemlock, fruit trees, etc., come out easily, quickly, permanently — ROOTS AND ALL! No pick or mattock necessary. Hook the TONGS around the growth and pull. No freezing or slipping. Heavy steel construction. Better than bulldozing or log chains. Every farmer needs one. If your dealer cannot supply you, order from us. PERFORMANCE GUARANTEED OR MONEY REFUNDED. Send check, M.O. No C.O.D.'s. Write for folder.

MODEL 62 — **$9.85 ea.**
(Trees up to 5" Dia.) use with any tractor. Wt. 19 lbs.
Add $1.25 P.P. & Ins. West of Miss. $1.75

MODEL 121 — **$19.75 ea.**
(Trees up 12" Dia.) For larger than 5" trees requires tracklayer (Crawler) or half-track tractor, or wheel type with 10,000 lbs. draw bar pull. Wt. 36 lbs.
Shipped Express Collect

RE-BO MFG. CO. 329-B Madison Ave. New York 17, N.Y.

1) They provide feed storage at a fraction of the first cost of most permanent silos.

2) They may be moved each year.

3) Self-feeding or the use of power equipment in feeding is a labor saver.

4) They provide the renter with a silo "he can take with him."

5) In large, well made stacks spoilage is not likely to be great enough to equal the use costs of upright silos or even to justify building a trench silo.

The disadvantage of stack silos are chiefly:

1) Spoilage is greater than in upright silos and usually greater than in trenches.

2) They make for disagreeable working conditions in heavy weather.

3) They are sometimes unsightly and if poorly located may cause offensive odors to reach the house.

4) Labor costs for feeding are excessive unless the silage can be self-fed or handled by power.

5) Without sufficient knowhow the farmer is apt to make a failure of a stack.

Minnesota seems to be typical of the trend toward grass silage in the Midwest. Three years ago only 900 farmers in that state made grass silage. Last summer 13,000 Minnesota farmers preserved their forage in that form. Stack silage accounted for a high percentage of this increase.

THE AUTHOR: Walter Weiss was born and raised on an Iowa livestock farm. After receiving a B.S. degree in Agriculture from Iowa State College in the late twenties, he taught agriculture and was County Extension Agent in northern Iowa. In 1935 he joined the staff of the U.S. Soil Conservation Service. Still with the Conservation Service he is now headquartered in Milwaukee, Wisconsin, as a Conservation Specialist.

HOGS FROM PIGS

(*Continued from page 59*)

ten times as big as he was at birth with less milk supply than when he was born. That is why most farmers will want to have him eating a good creep feed as soon as possible. Five days after birth is not too soon to start trying to get the pig to eat solid food. And the way to get him to start eating is to tempt him. You can play on his weakness for sweets— pigs have a sweet tooth—by sprinkling a little sugar or molasses over his creep feed or, if you want to be fancy, by feeding him the candy coated baby pig pellets. It's best to feed him the sweets early; if you start him on candy when he is a couple of weeks old he's liable to eat so much he'll scour.

Just so we don't confuse the frosting with the cake, the sugar coating will start them eating, but it is the feed itself that starts the pig growing toward the 200 pound mark. There are dozens of new types and kinds of feeds being used for creep feeding. The hog man should determine which one he will use by its availability in his locality and the particular job it does for him. One of the good and effective creep feeds is a mixture of 25 pounds of dry, antibiotic fortified, synthetic sow's milk, 50 pounds of oat groats or rolled oats, and 25 pounds of cracked corn. The single feed ingredient pigs like best is hulled oats or oat groats (broken oat kernels without hulls) and they thrive

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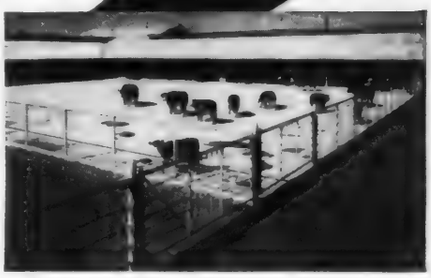

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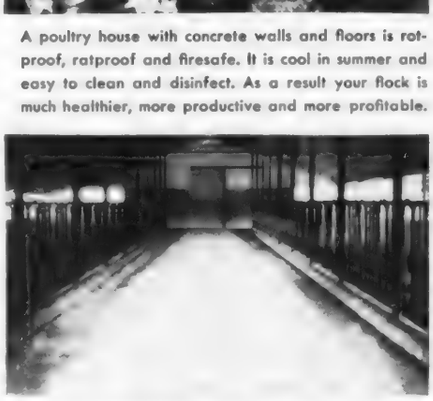

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on this mixture which gives them an antibiotic and milk solids along with their grain.

Another good ration suggested by Dr. W. L. Robison, who is in charge of swine at the Ohio State Experiment Station, uses a good deal more corn in the mixture. It is:

	Pounds
Cracked shelled corn	62.0
Wheat middling, ground wheat, or hulled oats	15.0
Fish meal, meat scraps, or tankage	7.5
Soybean oil meal	9.0
Ground alfalfa	5.0
Minerals	1.2
B vitamins concentrate	0.1
Vitamin B_{12} and antibiotic supplement	0.2

The B vitamins concentrate mentioned might be one of the commercial mixtures such as Lederle's Fortafeed or Merck's 58-A.

In buying ready-mixed creep feeds it might be well to note that pigs prefer pelleted pig starter feeds over feeds in the form of a meal and in pellets there is less waste, which easily makes up for the added cost of pelleting.

All the antibiotics, all the synthetic milk, all the super-snort creep feed fortified with minerals, however, can't substitute for good sanitation. I have actually heard farmers say that since we now feed antibiotics we needn't pay so much attention to sanitation! How wrong can they possibly be? I'll bet they didn't suggest that their wives stop washing dishes or scrubbing the floor just because we have penicillin. That baby pig must be kept clean, warm, and dry or he is going to lose out. Juicy hog pens are a short cut to unthrifty pigs, wasted feed, and a long, long trip to market weight. Hog pen juice seems to stimulate the scavenging instinct in baby pigs for most of them will drink it. There is nothing better than this bacterial soup for setting a pig back unless it is a good knock on the head.

A few days before or after weaning we should get the pigs from their first creep feed onto a starter feed and the switch should be made gradually over a period of days. This is a basic fact in all livestock feeding, particularly with baby animals—changing their rations should be a gradual process. Mix some of the starter feed with some of the creep feed and day by day increase the amount of starter feed and decrease the creep feed.

For a starter feed to take them from around 40 pounds to 80 pounds we like to use 200 pounds of soybean oil meal, 400 pounds of ground oats, 600 pounds of shelled corn, 25 pounds of sow's milk replacer, 50 pounds of meat scraps, 25 pounds of calcium, and 5 pounds of salt.

No livestock practice varies more widely or wildly than the feeding of hogs from weaning to butcher weights. The hog will eat anything and what is fed to it depends on how the farmer is situated. I remember a feeder back in the old days who fed fresh horse meat as a protein supplement. His methods were simple and direct.

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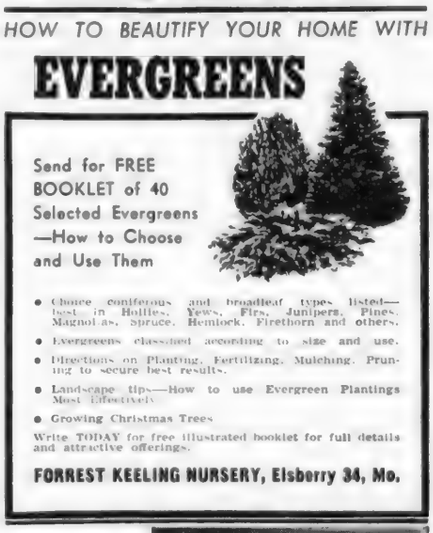
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Every so often he led a horse into the hog lot, shot it, skinned it, and, when the hogs were finally finished with it, dragged off the bones.

Today, we go in for a somewhat more complex mixture to balance the corn that makes up the bulk of the diet in the hog belt. Most every nutritionist will have his own private recipe for a protein supplement and there are a number of good ones on the market. One that I like is:

70 pounds alfalfa meal
100 pounds sow milk replacer (with antibiotics)
800 pounds soybean meal
200 pounds meat scraps
10 pounds calcium
10 pounds salt trace mineralized
10 pounds steamed bone meal

I feed this free choice with as much corn as they want to tuck away.

How the hog gets his corn is a different matter. I believe that the farmer who hogs-down corn or feeds it out of self feeding corn cribs with a free choice of supplement near by will get the most out of his feed and labor dollar. There has been some objection to hogging down corn because some is wasted in the mud during open fall and winter seasons. Electric fencing is the answer and some Iowa farmers are helping themselves by using the corn stalks as electric fence posts and tying the insulator to them. By fencing in a small area the hog will clean up everything instead of knocking down fresh stalks for new ears. Hogging-down corn appeals to me—the hog does my harvesting and feeding work for me and hauls out and spreads the manure at the same time.

However, if a man has a set of buildings he wishes to use and he has a good cement lot, he might want to build a corn crib along side it and arrange it so that it self-feeds as the hogs eat out of it. He can have his water and supplement close by. His efficiency will be pretty fair because he will be able to save a lot of labor scraping manure with a hydraulic loader.

I once had 100 bred sows that averaged about 500 pounds on a measured 9.2 acres of pure Ladino pasture. The lot was divided into two parts by an electric fence and the sows were rotated from one half of the pasture to the other depending upon the regrowth. They lived on this plot for three months without a single pound of grain or feed of any kind. The only thing fed to them was limestone and trace mineralized salt free-choice. Do you wonder that I believe in Ladino?

A good pasture that is rotated and clipped to keep it from getting rank is a money-maker whether it is ladino, alfalfa, red clover, lespedeza, or sweet clover. Temporary pastures can help out in any one season and rye, oats, wheat, rape, soybeans, cow peas, or a combination of these, do a good job in a pinch. For a fast climb to 200 pounds, however, any pasture may be supplemented with grain, protein supplement, and minerals. Since a good pasture will supply most of the minerals and vitamins all that is needed as extra feed is

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corn and a protein supplement of tankage and soybean meal mixed fifty-fifty. I would also give them a free choice of a mineral mixture such as 19 pounds of trace mineralized salt, 38 pounds of pulverized limestone, 38 pounds of steamed bone meal or dicalcium phosphate, and 4 pounds of powdered ferrous sulfate.

It is important, of course, to understand what we mean by a pasture. I've seen so-called pastures that were just good places to sharpen a hog's teeth and to give him exercise, but as a source of nutrients they wouldn't supply much more than a cement lot. When I speak of pasture, I mean a good legume crop with some ladino or alfalfa in it.

All pasture or dry-lot feeding programs are dependent for their efficiency on one simple universal material—water. A 100-pound pig needs a minimum of a gallon of water a day—and I don't mean the muddy, manure-solution some farmers make do for water.

So far, we have been talking about how to accelerate to get the pigs fattened for market fast. There are times, however, when you want to put on the brakes. Pigs born in April, May and June, if full fed and managed properly, would hit 200 pounds during November, December and January, when market prices are normally at the annual low. By limit feeding them we can hold them back so that they will reach the 200-pound mark in February or March when the market has usually taken an upturn.

Limit feeding means either hand-feeding the animals and giving them less than they have been eating or putting fillers in their feed and self-feeding them. Adding fillers means an added expense in grinding and mixing feed, but I believe that the lower cost of self-feeding over hand-feeding will pay off. I would recommend adding up to 25 per cent of ground corncob meal or ground alfalfa hay (not leaf meal) to the ration. The filler will slow down the rate of growth, but will continue the economical ratio of feed to pounds of weight added. Most important of all, you will wind up at a high market season with pigs that are not overweight. When a hog gets much above 200 the added weight is put on at greater expense and sells for a lower price.

As the marketing experts point out, 50 tons of feed will produce 108 head of light butcher hogs weighing 225 pounds and selling for $4.476.06 at $18.42 a hundred (which was last year's average for this weight) or the same amount of feed will produce 72 head of heavy butcher hogs weighing 300 pounds and selling for $3.730.32 at $17.27 a hundred the 1952 average for this weight). With hogs, as in any other livestock, timing can make a big difference in the profits.

THE AUTHOR: Al Haller is head of the Haller-Cadwell Feeder Pig Marketing Association, which markets forty-pound feeder pigs raised north of the corn-raising area to feeders farther south. He is a graduate of the College of Agriculture of the University of Wisconsin and has spent many years as a farm manager for general farms, dairy farms, and a pig hatchery. His home is in Sun Prairie, Wisconsin.

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WHEAT ROOTS TELL A STORY

(*Continued from page* 40)

However, there were still no marked benefits from nitrogen up to this time.

By the time the plots were visited at the end of May the effects of top dressings of nitrogen were quite apparent although in the roots the same relative differences of volume and color between treatments were maintained. "The surprising thing," Johnson recalls, "was the small increase in volume of roots between the late April and late May diggings."

Yields

But what about yields It's all very well to have nice long, healthy roots, but if they don't pay off in added bushels per acre they're not worth developing. Actually, yields on the test plots corresponded directly with root growth. Tillering, yield and quality, Johnson found, are all related to root growth and survival. Plants that lost part of their root system during the winter were forced to grow roots in the spring. These plants grew few tillers strong enough to produce good heads of wheat. On the other hand, plants that came through the winter with large masses of roots not only showed a tendency to grow more tillers but grew vigorously from the moment they emerged from dormancy producing higher yields of quality grain.

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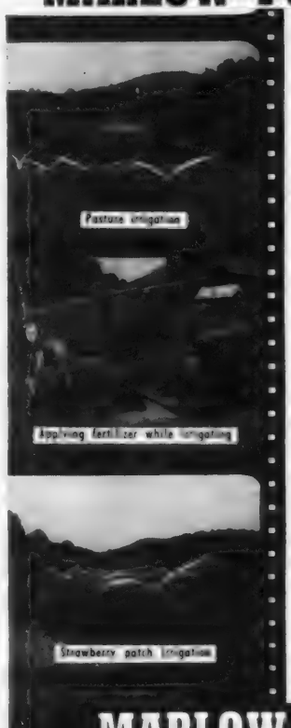

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A little study of the four-year average yields in the table on this page will show where the payoff lies in wheat fertilization. As against the check plot, a maximum gain of 30.2 bushels was obtained by the use of the complete treatment with lime, nitrogen, phosphate and potash. If either nitrogen or potassium were held out of the application there were reductions of about 10 bushels per acre. A lack of lime or phosphate cut yields 20 bushels. As is indicated in the lower part of the table, response from any single nutrient is very disappointing when the other three are missing. Application of potash alone, nitrogen alone, and potash and nitrogen combined, actually reduced yields in comparison with the check plot.

Limestone alone increased yields only 7 bushels per acre over the check, but it gave a great boost when brought to the aid of any of the other three elements or combinations of them. It was responsible for a 19.9 bushel increase when added to the nitrogen-phosphate-potash combination (LNPK vs. NPK).

Phosphate by itself showed a five-bushel improvement over the check but when it was added to limestone, nitrogen and potash it jumped yields 20.7 bushels. This phosphorus, 40 pounds drilled with the wheat, produced a result typical of the effects of phosphates when applied early. The wheat needs relatively large amounts at the time of germination.

Average Wheat Yields of Sixteen Key Plots from Brownstown Soil Experiment Field, Brownstown, Illinois

Treatment [1]	*4-Yr. Ave. Yields* bu.	*1952 Yields* bu.
None	3.4	0
LNPK	33.6	25.4
LNP	23.6	19.3
L PK	23.4	18.8
L P	18.2	11.5
NPK	13.7	4.6
LN K	12.9	11.4
L K	12.3	7.3
L	10.4	3.8
LN	8.4	2.6
P	8.4	1.5
NP	7.0	4.0
PK	5.0	.4
K	1.7	.5
N	1.3	.8
N K	1.1	.9

[1] Treatments:

L—Limed, 4 tons 1940, 2 tons 1948.

N—Nitrogen 40 lbs. on wheat, 80 lbs. on corn.

P—40 lbs. P_2O_5 drilled with wheat and 40 lbs. broadcast on clover stubble.

K—50 lbs. K_2O per acre per year average broadcast ahead of wheat, clover and corn.

Potash, when brought to the assistance of the other three plant foods, upped yields exactly 10 bushels. Long term observations on the southern Illinois fields showed that potash deficiencies don't begin to assert themselves until years after limestone and phosphate treatments have been made. The stepped up yields brought about by these treatments finally use up the available potash supplies in the soil.

Though the nitrogen application by itself brought about a decrease in yields, in combination with limestone, phosphate and potash, N could claim an increase of

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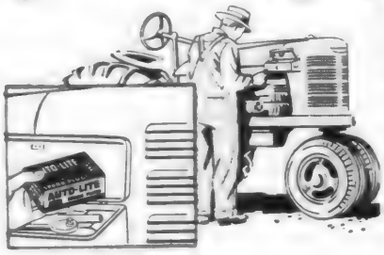

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10.2 bushels (L-PK vs. LNPK). This was from an application of 40 pounds of nitrogen and was somewhat better than is ordinarily expected. Illinois farmers usually look for a one bushel increase for each five pounds of nitrogen applied.

"In playing around with these roots we also had a wonderful opportunity to study the physical condition of the soil," Johnson observes. "Every time we dug up a bunch of roots from a plot that had never grown clovers we invariably found a plastic soil layer just below the plowed layer. It was really a tough job to wash the soil away from these roots. The roots don't penetrate this layer readily either and neither does drainage water. We found many of these plots water-logged.

"We found the soil washed away much more easily from root samples taken from plots that had grown deep-rooted legumes properly fed with limestone, phosphate and potash."

This spring, again, Pat Johnson was hard at it digging up his wheat roots and collecting the evidence of the plants' response to fertilizer treatments. Winter kill hasn't been licked yet even on the most heavily fertilized and best balanced plots. There are, apparently, other angles to the problem that must be revealed with further research. But the roots are continuing to tell a consistent story: "We can't do our job on anything but a balanced ration."

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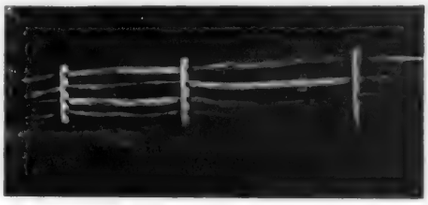

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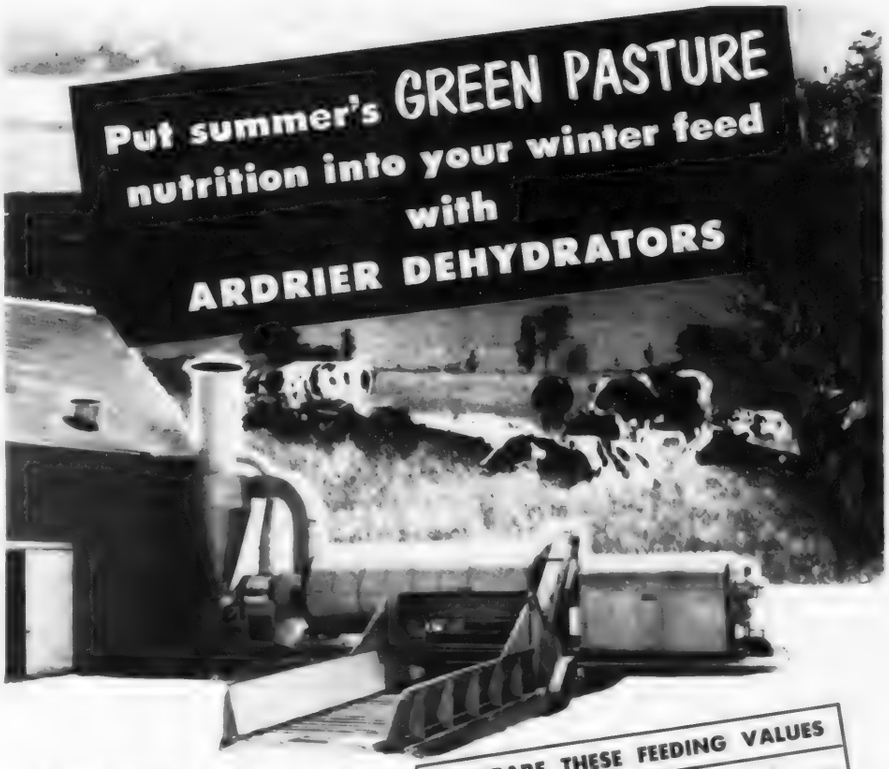

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NOW you can feed your stock the tender, succulent nutrition values of summer-green pasture, *every month in the year* . . . and know you're using the least expensive feed you can get to produce top quality milk, meat, eggs, poultry!

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And the beauty of it is the *low cost* of processing your own feed that assures healthful winter rations and helps you operate at a higher profit. Farmers report their Ardrier Dehydrators are paying for themselves in a short time.

Prepare for low-cost winter feeding *now* by investigating all the advantages of "flash drying" your forage crops to assure green pasture nutrition the year 'round.

Mail the coupon today for literature describing the many economy features of Ardrier Dehydrators, and find out how to save on your feeding costs.

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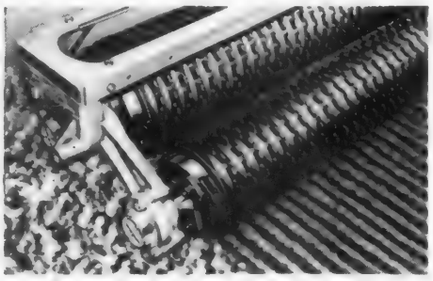
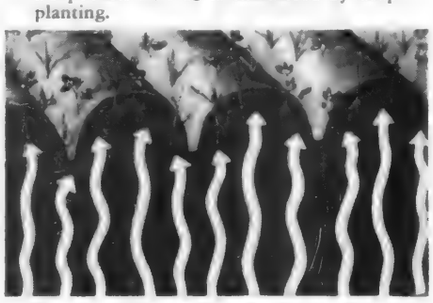


Works cloddy soil into a fine mulch . . . in just one trip over your field, the Brillion Sure-Stand Seeder crushes lumps and clods into a fine, well-worked seedbed; plants the seed; and gently firms the soil. Notched pulverizer wheels stipple the ground to catch and hold rain.

Tucks each seed to bed in the top half-inch of soil . . . moist soil is gently packed around each seed. No seed falls into barren air pockets . . . or is smothered by deep planting.



Brings moisture up from below for better germination. Farmers report good stands even in dry years with the Brillion Sure-Stand Seeder. That's because the Brillion caps the seedbed as it firms. This reduces evaporation and retains more moisture at seed level for higher seed germination.

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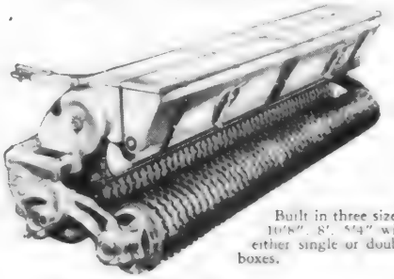

Built in three sizes; 10'6", 8', 5'4" with either single or double boxes.

Brillion

SURE-STAND SEEDER

Acknowledged Leader of *ALL* the Seeders

(*Continued from page 34*)

the start of the wide acceptance of Diesel powered big crawlers in the Western states.

Almost anyone will get a kick out of their first solo trip on a crawler. There is a feeling of tremendous power that ripples along on the two tracks below. One Indiana farmer proceeded to drive right through a fence when he was taking his first spin. When asked why he didn't turn, he said, "Aw, she was going so good, it seemed like a shame not to let her go out in that big pasture."

In place of the familiar tractor steering wheel, a crawler has two hand levers for steering. In some crawlers these serve as clutches to throw one track's power off. Individual brakes on either track hold them for tight turns. Some models use track brakes and have no clutches on the individual tracks. One type of tractor maintains power on both tracks at all times and in turning one track is held back by the brake while the other speeds up. Some have a combination of both types of control. In any case, the method of turning is by holding one track back while the other does the pulling. A crawler is a nimble beast considering its tremendous size; it can make a turn as short as its length. The driver need exert very little effort, in fact, one Midwest Oliver serviceman maintains, and proves, that he can make a crawler driver in half an hour out of any boy who can reach the clutch pedal; in another half an hour he can turn him into a bulldozer operator.

The power for the crawler tracks is applied through a gear train similar to but much heavier than that of a wheel tractor. Because much of the starting is done under full load, the clutches must be particularly rugged. Both the brakes that control the steering and the clutches are adjustable through face plates on the rear of the final drive gears or from under the driver's feet. The power is applied to the tracks by big sprocket drive wheels. Four forward speeds operated by a conventional gear shift lever give speeds from about 1½ mph to 6 mph in most models. Reverse gears that give one slow speed and one medium speed are available on most crawlers. The track units and the main frame are connected by heavy multi-leafed springs which allow one track to ride up over a stone without tilting the whole tractor. The tracks on some of the larger machines will weigh a ton and putting them back on—if they jump off—is a job for a skilled and husky mechanic. Luckily, they rarely jump. All crawlers have an adjusting bolt for the track somewhere along the frame. The adjustment is easily measured by the amount of sag in the top of the track. The idea is to keep them as loose as possible, to hold down wear and make turning easier. They are *never* oiled or greased. This would make them pick up dirt and cause fast wear. Although the tracks

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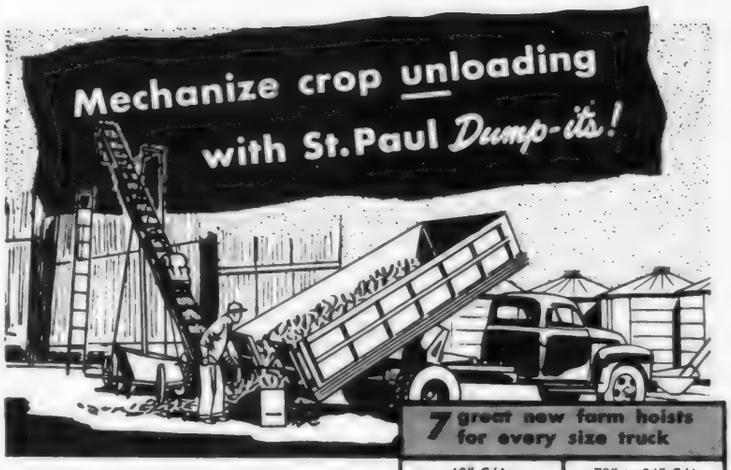
don't need grease, practically everything else about the crawler likes to bathe in it. The rollers on which the tracks ride, the idlers (providing the front suspension of the track), are just about as serviceable as the operator is handy with the big Alemite pressure grease guns that are a part of the standard equipment.

Although the power is applied at the rear of the tractor, the weight of the engine and frame are distributed over the entire length of the track; from this the crawler gets its tremendous pull. If one grouser plate fails to bite into something solid, there are at least 20 others to jump in somewhere else on the ground and lend a heave. Although the grousers do wear down in time, there will be enough left after many year's service, to give good traction, because of the two or three tons pushing them into the ground. Ten years of heavy service on one set of tracks is a fair figure on farm use. Track pins may have to be replaced after 2500 hours, and their cost corresponds to buying new tires for a wheel tractor.

Most farmers who have been around tractors know the principles of keeping a gasoline engine in good shape: clean oil of the right grade in the engine; the right specification mineral oil in the hydraulic system; air filters cleaned daily when in heavy operation. A crawler needs all of these *plus* the daily greasing of the track rollers and fittings. That's the price you pay for not having to check the air in the rubber tires or worry about a puncture. Some crawlers, such as Allis-Chalmers, have spring-loaded grease seals which hold enough lubricant for up to 1000 hours of operation.

In addition, the Diesel engines of the big crawlers need a kind of care that is special to their operation. If you give them this care, they'll run for years without ever loosening a bolt. The first thing to know about a Diesel is that it runs because it *is* hot, not in spite of it—as a gasoline engine will do. Diesels need a constant temperature of 165°-190° F. to operate efficiently. The thermostats in the radiator are set to keep the engine at this range. That is about 20° hotter than is wanted for a gasoline engine. The trick is to keep them from getting hotter, for if the engine gets much hotter, it will boil water out of the radiator. It is especially important to keep Diesel radiators free of lime and deposit. And the front of the radiator must be kept free of bugs and leaves, or the engine will develop a fever. A Diesel engine has its fuel oil fed into the cylinders under high pressure by injectors. The explosion takes place as the result of the pressure and the heat of the engine. Spark plugs are not used, except in those engines which are started on gasoline. Some Diesels are started after warming them up with a blowtorch. The Caterpillars use an auxiliary small gasoline engine to get them going. The Allis-Chalmers starts on Diesel fuel and an electric starter.



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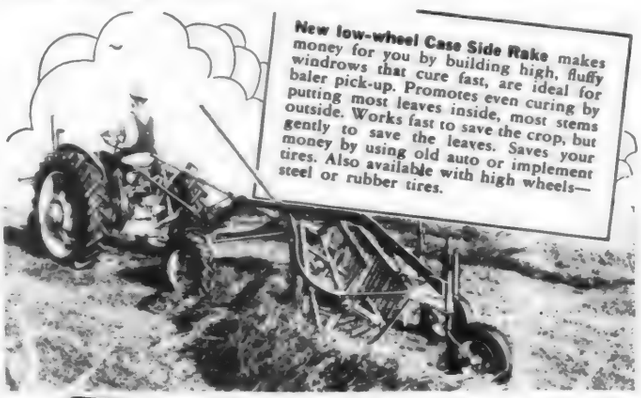
CASE AUTOMATIC BALER

Steady flow of hay from windrow to bale is one reason for big tonnages reported by owners of the Case "NT" Twine-Tie Baler. The big-diameter pick-up drum lifts hay gently to the tight-bottom table. Apron, assisting auger and floating feed drum deliver a steady stream into the side of bale chamber—the same "continuous side-feed" principle used in the original Case Slicer-Baler. It furnishes uniform slices, helps make the neat, firm, full-weight bales for which Case balers are known, saves more of the precious, protein-rich leaves.



New low-wheel Case Side Rake makes money for you by building high, fluffy windrows that cure fast, are ideal for baler pick-up. Promotes even curing by putting most leaves inside, most stems outside. Works fast to save the crop, but gently to save the leaves. Saves your money by using old auto or implement tires. Also available with high wheels—steel or rubber tires.

See your Case dealer about any kind of hay machine. Look at the Long-Cut Forage Harvester that chops hay just right for barn-finishing or storage fully cured. See the Eagle Hitch Mower that mounts in minutes on Eagle Hitch Tractors; also Trailer-Mower that hooks in a jiffy to most any modern tractor.

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. . . also catalog or pictorial folders. Mark here or write in margin any size tractor, any implement or farm machine that interests you. J. I. Case Co., Dept. Y-80, Racine, Wis.

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A Diesel engine can operate at a low cost because it burns cheap fuel—No. 2 Domestic Furnace Oil—which costs from 12c to 15c a gallon in different parts of the country. But it also is a great believer in fresh air, and takes from 4 to 8 times as much as a comparable size gas engine. To be sure the engine will develop full power, the operator has to keep the air cleaner really clean for it takes a healthy slug of air every other stroke in a 2-cycle engine. In extremely dusty field conditions, the air filter should be cleaned every four hours of operation.

A Diesel engine is rated at several times as rugged as a gas engine but it is sensitive to dirt and dust. So the manufacturers have built a special line of cleaners and filters for every part of the engine. The problem is to get farmers to realize how much more important these cleaners and filters are in Diesel operation than in gasoline operation.

Keeping Crawlers Running

Unlike the old saw that fathers used to quote to their sons about buying a horse and buggy—"it isn't the original cost, it's the upkeep"—in a crawler, the big cost is the original cost. The upkeep is low, considering the work done. Walter Findley, who farms four places totaling 500 acres around Seymour, Indiana, uses a John Deere MC, which he bought in 1949. He says, "My son, Laurence, is pretty handy with tools, and uses lots of grease and oil, but he has kept costs down on our little crawler. We haven't spent $15.00 on parts since we got it. The Deere uses gasoline, of course, which brings the cost of fuel higher than a Diesel. But, at that, we go out and plow an acre an hour of our bottom land with a 2-furrow 14-inch plow, using about a gallon of gas. We give it rough use, too, hauling in logs for our farm sawmill. If we knew what our depreciation was, and we won't 'til we talk trade with Browning Brothers, we could give a more accurate figure on our operating costs. It sure looks like it would be under 50 cents an hour. We keep it busy all the year 'round; because it's light, we can load it on a truck and haul it to any of our farms in half an hour. Last summer, my brother was in the dumps about his 10 acres of sweet corn. It was ready to pick, but the fields were sopping wet and he had got stuck with his tractor and wagon. We hauled the MC over and it walked right through, pulling the wagon and a load of corn."

Out on the plains, Dale Peterson of Fargo, North Dakota, says, "We do twice the amount of work at less than one-half the fuel cost. We turn sod with our D-4 Tractor by hitching two 3-bottom plows behind. Then we bust it up with a 21-foot Omaha tandem disk with five sections of drag harrows to level at the same time. We can get over 76 acres a day in third speed; that's right at 3 miles per hour."

The average cost for running this type of crawler would be about $1.50 an hour, based on depreciating the cost over 5 years. This is a 43 h.p. drawbar Diesel engine that is capable of pulling almost any farm load. In the smaller 30 h.p. group of Diesel crawlers, costs may drop as low as $1.15 per hour of operating time. Gasoline engine models in this h.p. class, would take an hourly cost of about $1.25.

Gasoline or Diesel

The decision as whether to buy a gasoline or Diesel engine crawler will have to be based on the farm conditions. If the crawler is to be used 1000 to 2000 hours a year, a Diesel will pay for the extra investment by lower fuel costs. If the yearly use falls under 500 hours, there is a good argument for the cheaper gasoline engine. As one Indiana farmer said, "I can buy a lot of gasoline with $1000." Another point to consider is that the gasoline engine is going to require more maintenance, but this maintenance is very much like that needed on the farm truck and most farm mechanics can take that in stride. A Diesel engine may call for a specialist, and in some farm areas, he may be 50 or 100 miles away.

One Illinois farmer who has used crawlers from way back and has seen the change from gasoline to Diesel, is Kenneth

Ziegler of Stonington, Illinois. He says: "I have been a Caterpillar owner from 1924 to the present time. The one now owned is in partnership with my brother in our farming operations, a Cat D-4 Tractor of some 43 draw-bar horse power. I have been an owner of Cat Tractors for 22 years in farm operation, first the gas and now the Diesel.

"The track-type tractor cannot be beat where traction is a factor to be considered, and you have loose soil that packs," says Ziegler. "The track tractor usually pulls its load at a speed somewhat slower than the wheel tractor, but pulls a greater number of plows or feet of tillage tools and makes fewer trips and for the day does more acres per man. We think the slower speed is the making of a better job in discing and deep tillage work. Our Cat D-4 pulls its load without a trace of soil packing, and here on our black soil, a track stays a long time and it takes a lot of work to get it out. That is one of our biggest arguments for ownership; we pull 5-16" plow bottoms and plow on an average of 3 acres per hour, sometimes more, other times less. Soil conditions govern that; we also pull 20 feet of tandem disc harrow, and at times, 22 feet of spike tooth harrow back of the disc. Without the harrow, we generally get 100 acres per day. We also pull a Graham Hoeme 16-foot deep tillage plow. The D-4 and the two-row corn picker make a fine corn harvesting unit, one that can be used in all kinds of weather and soil conditions. The combination of implements that can all be pulled at one time without slippage make for cheap operation and should be used whenever possible."

The Hardpan Problem

Plowsole hardpan has become an increasing problem in the midwest. It comes from years of moldboard plowing, and the pounding force of wheels of tractors, which use the last furrow as a guide for making the next round with the plow. The hardpan prevents the percolation of water down into the subsoil and the ground is not able to retain its normal moisture supply. When this happens, even light rains can cause erosion, for the water runs off instead of soaking in. The hardpan not only acts as a water barrier but actually stops the growth of plant roots downward into the rich, mineral holding subsoils.

In California, the problem of plowsoles has become a real crop hazard. With rowcrops like sugar beets, the soil must be worked considerably in the preparation of the seed bed, in controlling the weeds, in furrowing for irrigation and in harvesting. A plowsole under an irrigated crop causes the water to stand around the plant roots and in many cases will cause rotting.

Crawlers offer a solution to the plowsole problem, for their tremendous power can pull big tools: big plows for deep penetration, subsoilers, chisels and special tools that break up the hardpan and open up the subsoil to a depth of 2 or 3 feet. This allows moisture to soak down into the soil and beyond into the subsoil. In time, this will add to crop yields. Studies made by the Division of Irrigation at the Davis Experiment Station of the University of California during the past year have shown that the soil damage is only half as great with crawlers as with wheel tractors. Tests have been made to study the infiltration of water in soils worked by the two types of tractors. Further studies are being made to see whether the greater tread width of crawlers may cause compacting after a number of years.

Power is the crawler's stock in trade and with it many a farmer has been able to put cultivating tools down deep enough to renovate worn-out pastures and cropland with a total effect of adding acres to his farm. In the West there are special uses for deep plowing: 1. To bring up good soil which has become covered with sand during floods, and 2. To break up alkali hardpan which often develops on irrigated land.

California crawler dealers have sold to the farm market, but in the Midwest, it has generally been the farmer who has "sold himself" and bought a crawler. The continuing demand for crawlers for Government use and road building has kept the

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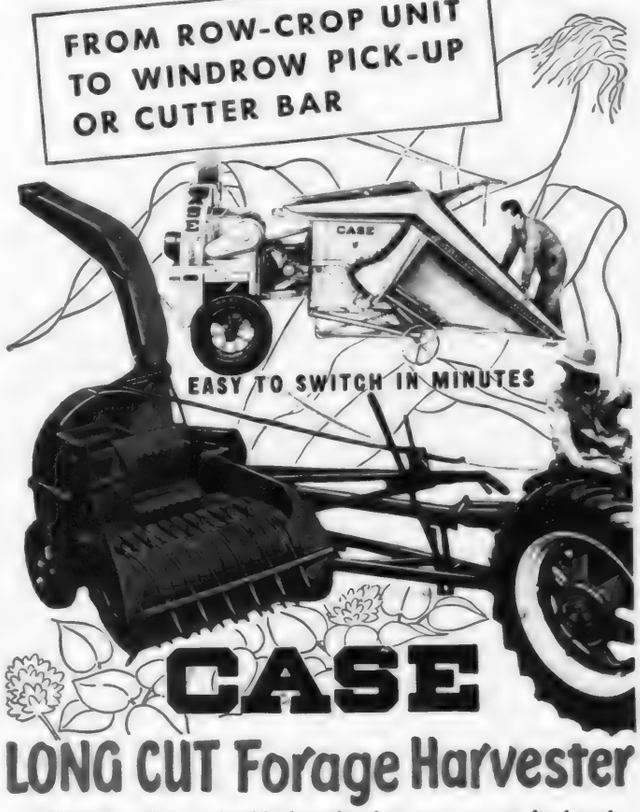
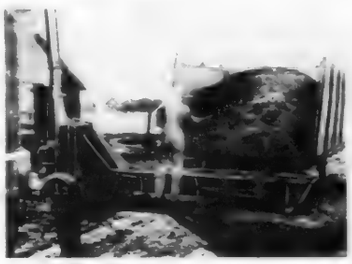


CASE

LONG CUT Forage Harvester

Chops hay into palatable lengths that are easy to feed and livestock like to eat. Gathering units are changed in a few minutes. This quick, easy switch lets you work row crops, standing hay or windrows for silage or hay . . . whether green, wilted, or cured . . . with one base machine. Low-speed knife wheel handles hay gently, helps to make Case the lightest-running forage harvester. Its outstanding light draft is also aided by simple design with few moving parts, anti-friction bearings, oil-bath gears, high-strength steel for light weight. All this saves power to cut extra tons every hour with 2-plow or larger tractor.



CASE Forage Blower

Handles all kinds of silage, chopped hay, straw reclaimed for bedding. Has big capacity to keep ahead of fast forage harvester. Spring-balanced hopper raises for truck to drive in—no backing. Unloading device (extra) empties apron-bottom wagons steadily. Flexible pipe unit simplifies set-up at barn or silo. Be sure to see the safety and convenience features of this handy, high-capacity blower.

See your Case dealer about this blower and forage harvester, also the standard-cut forage harvester using the same three quick-change units—fine for all silage crops. Ask him about latest model of Case Automatic Baler, heavy-duty hay rakes, Eagle Hitch quick-mounted mowers for Case Eagle Hitch tractors, also trailer mowers.

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☐ Forage Blower
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100 feet of 1" ClearStream weighs less than 20 lbs.—1/8 the weight of steel.

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BE SURE before you buy. There is a difference in plastic pipe. To protect you, Yardley guarantees ClearStream pipe two ways—100% virgin materials—full weight and wall thickness meeting Approved Standards for the industry.

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It's new, faster, better. Two joined pipes extruded and coiled as one in perfect alignment—that's "Twin-du-it." Install without forcing or binding.

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Insist on ClearStream
Look for the Name on Every Length

factories busy and little effort has been made to get out and develop the farm market. The farmer who wants to use a crawler should investigate the service angle. He should find out what makes of crawlers have nearby dealers who are willing to give him "on the farm" service. Good service has sold many a wheel tractor over competing makes, and it is as necessary with crawlers as any other farm machinery.

Tool Bars

In big crawler models, one of the most versatile new pieces of farm equipment is the hydraulically controlled tool bar made for the Caterpillars. The tool bar is hydraulically operated and can be controlled accurately for raising, floating or forcing the tool into the ground. Such tools as cultivators, ditchers, chisels, subsoilers and root planers can be added as needed. If the soil is heavy, perhaps only one subsoiler can be pulled. In lighter soils, the same crawler might be able to pull three units.

The tool carrier principle has been used, too, on the small member of the crawler family, the Deere 40, to hitch on plows, listers, chisels and cultivators. By swinging the tool bar draft equipment to the front of the tractor, the same hydraulic cylinders serve to operate a bulldozer blade.

On any crawler, the addition of a bulldozer unit gives it a whole new range of operations, makes it a farm tool for grading, clearing and pond building.

Drawbar Tools

For the farm that has a full toolshed of drawbar tools, there is very little adjustment needed to pull them behind the crawler.

Most implement manufacturers make a line of heavy duty tools which are suitable for the rough use behind a crawler: Allis-Chalmers, Case, Deere's Killefer line, International, Krause Plow Corp., Hutchinson, Kansas, Minneapolis-Moline, are some of these.

The Graham-Hoeme Plow Company of Amarillo, Texas, makes several sizes of sub-soilers with various type of points for chiseling the soil without turning under the cover on top of the ground. Emerson Mfg. Co. of Denver, Colorado, makes special irrigation tools, such as ditchers and levelers.

In the big disc harrow and bush and bog harrow line are Athens Plow and Taylor Implement, both of Athens, Tenn., Rome Plow of Cedartown, Ga., and Towner Mfg. Co., of Santa Ana, Calif.

Not everyone can make use of the crawlers, but if you have the acreage and the big and tough jobs to do, these Paul Bunyans will tear into them, with no complaints.

"I needed a building that was reasonable in cost yet sturdy and durable"

says Harold O. Reif, Renfrew, Pennsylvania

AND HERE IT IS—"roomy enough to accommodate various classifications of cattle in separate pens—large enough for hay and straw storage—and above all, as fire resistant as possible."

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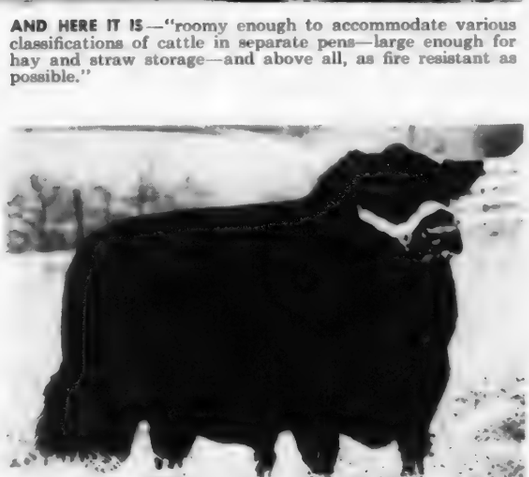

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FROM Bonniecroft Farms, Mr. Reif writes us: "For the past ten years I have been an owner and breeder of pure-bred Aberdeen-Angus cattle. From the time that Bonniecroft Farms were first established, it has been my ambition to erect a building which would meet all the requirements I felt necessary for the proper care and protection of valuable show and sale cattle.

"It would have to be reasonable in cost, yet sturdy and durable—attractive in appearance and with ample daylight—easy to clean and to maintain—roomy enough to accommodate various classifications of cattle in separate pens—large enough for hay and straw storage—well ventilated, yet not drafty—and above all, as fire resistant as possible.

"I am very proud of my steel building because it not only meets the above requirements, but I find that my cattle are better cared for with less effort and are more easily maintained in a thrifty condition."

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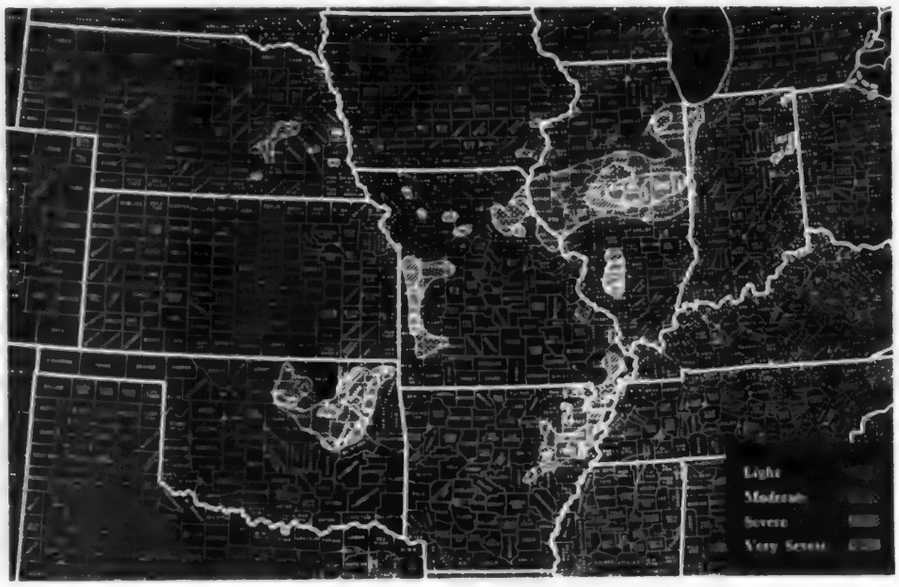

There's a New Way to Stop Chinch Bugs

By Charles R. Koch

SURVEYS indicate that with a few weeks of hot, dry weather in late May, June and early July, chinch bugs will be poised to launch an attack of no small proportions in the central corn belt.

But if and when they launch that attack they are going to run smack into one of those powerful new bug killers—dieldrin. About five years ago a trio of entomologists at the University of Illinois

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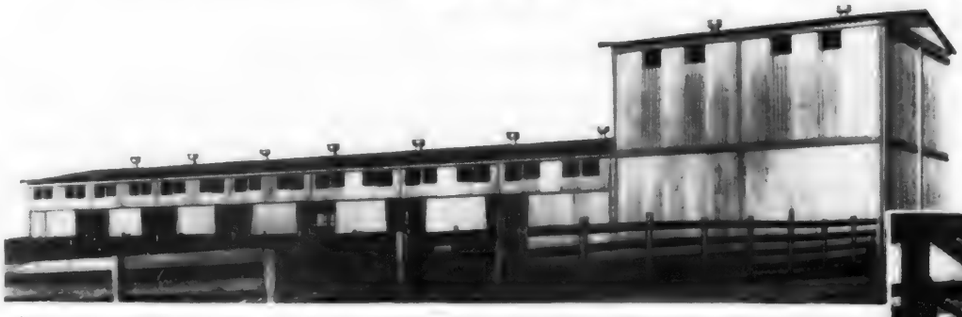

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and the Illinois Natural History Survey—Dr. G. C. Decker, Dr. Carl Weinman, now deceased, and J. H. Bigger—decided that if farmers weren't sick and tired of the old creosote barrier methods of trying to stop the recurrent chinch bug invasions *they* were; and, sizing up the impressive list of recently developed insecticides, they began to test them on chinch bugs in the laboratory.

They'd take a spot of soil ground to a fine dust and impregnate it with one of the chemicals to be tested, then put a mess of chinch bugs on the spot and observe the results. They soon found that a number of the insecticides—toxaphene, chlordane, BHC, lindane, parathion, aldrin and dieldrin—would all knock the bugs colder than yesterday's coffee. Of the materials now available on the market, dieldrin was far and away the best they tried and it had a long residual action. Residual action, or lasting power, is an important point. Chinch bugs are persistent. They don't make just one half-hearted attack and quit if they find themselves repulsed. Like all insects, they keep right at it and they're back pounding on the door day after day for a matter of weeks if the weather stays favorable to them. So a chinch bug weapon must have staying power.

The Culprits

Chinch bugs are hardly as long as the lead on a newly sharpened pencil. The young are red, the adults black. One needn't worry if he has trouble identifying an isolated bug here and there. Chinch bugs are always in the plural. They come in droves. They belong to the insect order of *Hemiptera,* which the entomologists call the true bug, and are a close relative to the bedbug, the stink bug and the water bugs. They are restricted to the corn belt, with Indiana, Illinois, Iowa, Kansas, Missouri, Ohio, Nebraska, Oklahoma and Texas being their usual stamping grounds. They have shown up in Michigan, Wisconsin, South Dakota, Minnesota and even down in North and South Carolina on occasion.

A full-grown chinch bug

In the fall of the year the adults settle down on bunchgrasses like broomsedge or bluestem, and in trash along the protected side of woods, to over-winter. Burning off the bunchgrass used to be recommended. Illinois entomologist Bigger discounts this idea, though. "Burning gets only the tops of the plants," he says; "the bugs are all down at the base and on the ground surface. They don't even get singed."

Warm spring weather brings the bugs to life again. On the first sunshiny days that the thermometer reaches 70 degrees and hangs there for a few hours they try their wings and fly to the nearest fields of small grain, usually winter wheat or barley (barley's their favorite). Since they are partial to sunlight, thin stands of grain are much more attractive to them than thick, luxuriant growths. Here they mate and lay their eggs. The young stay in the small grains as long as the host plants have anything to offer in the way of nourishment. As the plants begin to ripen and the sap stops flowing they start their migrations to the cornfields. In the warmer climates they may skip this interim period in the small grains and fly directly from winter quarters to the corn.

They'll feast on any kind of grasses, but corn and the sorghums are their favorites and they'll go through hell 'n high water to get to them. Farmers who have tried planting strips of soybeans between their wheat and corn fields have found that the bugs have raced through the beans, cleaning out all the grass and every stalk of volunteer corn that stood in their path and never touching the beans. They will take a field of timothy right in stride and come out on the other side with an appetite just as ravenous as when they went in.

But legumes are another matter. A thick stand of clover or alfalfa in the small grain will really stop them. The legumes produce shade and dampness, a condition they just can't stand, and since their migrations from small grains to corn are strictly on foot, they are forced down into this humid atmosphere, where

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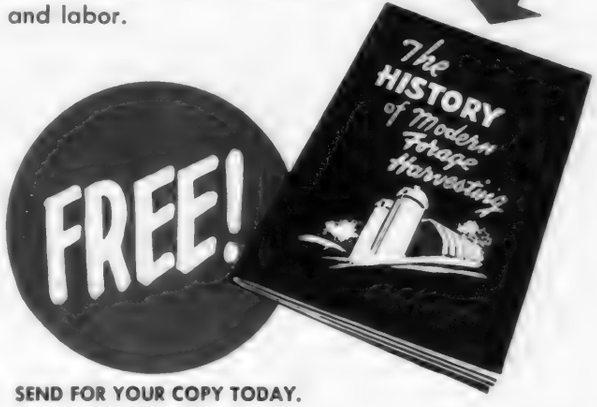

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they perish, "Pete" Petty, Illinois' Extension Entomologist, can cite numerous cases of farmers who drill their wheat in 14-inch rows and use sufficient fertilizer to insure strong stands of legumes and grain to make things just as unpleasant as possible for the chinch bugs.

When they start invading a cornfield, the situation really begins to get serious. Not that the bugs don't do enough damage in the small grains. A bad infestation in any of the cereals can make harvesting a pointless operation. Unfortunately, there is nothing as yet that can be done about that. If they are allowed to go unchecked in the corn in a hot, dry season the crop will be a total loss. Since there is no stopping them once they become established in a field, the first line of defense is also the last and it had better be good. That's where dieldrin comes in.

The Old Way

Oldtimers know what a job it was to follow the time-tried method of building and maintaining a creosote barrier. That meant plowing a furrow along the side of the cornfield from which the bug invasion was expected, laying down a thin ribbon of creosote on top of the furrow, or in the event a furrow was not plowed, of building a barrier of creosote-soaked paper the length of the field, with postholes dug about every two rods on the small-grain side of the barrier to trap the bugs as they were repelled by the creosote. These barriers required constant attention during the time of the invasions. A light rain or a bit of wind, a twig or leaf falling across the line to form a bridge over which the invaders could pass and the Maginot Line

When chinch bugs smother your corn it's too late to do much about them. Go into action with your spray rig before they start their migration from the small grain.

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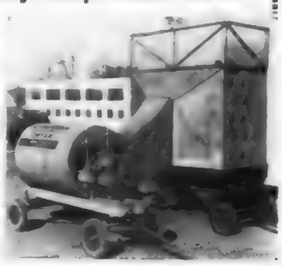

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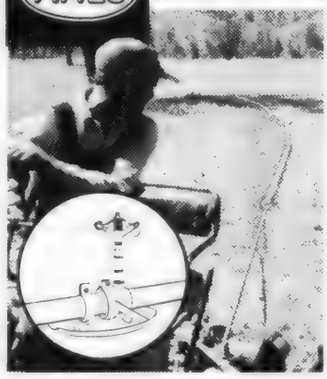

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was broken. Then, the posthole traps had to be watched carefully, too. The bugs in the traps had to be killed and the carcasses removed.

And the New

The dieldrin, which is produced for commercial usage as an emulsified concentrate, is sprayed on a strip about four rods wide, half the strip lying along the edge of the cornfield and the other half along the edge of the adjacent field of small grain. Whereas the creosote was merely a repellent that drove the bugs into traps, the dieldrin is a deadly poison that kills them on contact. The dieldrin is applied at the rate of a half pound per acre, dries immediately on the ground and lower portions of the plants and has proven effective in field tests against moderate infestations for seven to fourteen days after application. In laying down the barrier it is necessary to spray strips at right angles to the main line at each end of the field along both the corn and the small grain to keep the bugs from executing an end-around maneuver.

This method isn't expensive when compared to the number of bushels of corn the bugs can ruin. Dieldrin was selling in central Illinois this spring in a 20 per cent emulsion concentrate solution for $9.50 per gallon. At that price it would take about $3 worth of material to spray an acre, or a strip four rods wide and forty rods long. Assuming this strip represented one side of a square field, this would mean that $3 of material would protect a 10-acre field of corn which, if it yielded only a 50-bushel crop, would be worth $750 at $1.50 per bushel; even if no more than one acre of the field were in jeopardy, the $3 spray job could be credited with saving $75 worth of corn.

Of course, no one is advocating that a farmer spray such a strip in the face of a serious invasion and then go away and forget it. He'd better check it pretty frequently all the time the attack is on; a daily look-see wouldn't hurt a bit to make sure there has been no break-through anywhere along the line. But the odds are the line will hold. An additional treatment or two might be necessary in a severe infestation.

Early action is essential, too, before the chinch bugs begin their migration. Every farmer in an area in which an infestation appears imminent would do well to watch carefully his small grain so he can lay down the dieldrin strip before the pests get into the corn. They can be found by stripping the lower leaves from the greenest stems of the plants and examining under the sheath and on the ground for the tiny red nymphs.

All Weather Protection

Rain won't hurt the dieldrin. Bigger recalls an experience he had in DeWitt County, Illinois, during the moderate infestation two years ago. "We had a real

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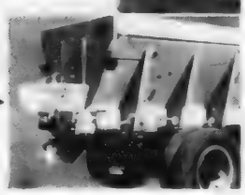

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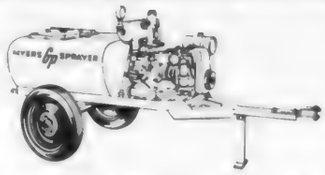

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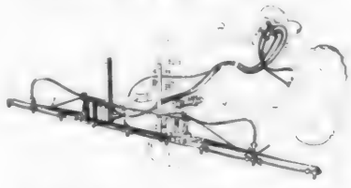

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gulley-buster the night after we sprayed the strip," he says. "It rained two inches or better, but the dieldrin still did the job, and a good job, for seven days afterward."

Spraying can be done with any kind of ground or aerial equipment used for insect control, with the warning, of course, that equipment that has previously been used for treating with 2-4.D should be cleaned carefully before using the dieldrin to prevent any possible damage to legumes. Kerosene washes followed by detergents and ammonia are recommended as satisfactory for this cleaning job.

Because of the residual effect of dieldrin no small grains should be harvested within seven days of treatment and corn fodder or straw that has been sprayed should not be fed to livestock. In connection with this precaution, Biggers suggests clipping the two rods of small grain where the strip is to be sprayed and hauling it to the henhouse. "Those old hens will find plenty of good eating in their bedding," he grins as he reflects on the economy of the move.

Predictions

The map on page 100 indicates where chinch bug outbreaks may be expected this summer. Central Illinois apparently is slated for a rough time. Missouri, Arkansas and Oklahoma may have sizeable infestations, while scattered trouble spots are indicated for Nebraska, Iowa and eastern Indiana. Farmers in 19 northwestern Ohio counties reported evidence of chinch bugs last summer and it is possible that the Buckeye state may also find itself with an invasion on its hands. Fortunately, these predictions may be 100 per cent wrong. Chinch bug infestations are directly dependent upon weather conditions and are just as uncertain as the weather.

The predictions are based upon an actual count by state and Federal field men who take samples during the fall of bunchgrasses and other matter suspected of harboring overwintering bugs.

If the weather in the sections designated for infestations is hot and dry in May, June and July the bugs will be there and the battle will be on. High winds at that time could blow them to the adjacent counties, too. But come some cloud bursts and muggy, sweaty weather, there won't be a bug to be seen at combining time.

To sum it up, the dry summer of 1952 was very favorable to the increase of the chinch bug population in the mid-West. Dieldrin sprayed on the border of corn fields in the path of an invasion at the rate of one half pound of the actual chemical per acre will definitely kill the bugs on contact and its residual action is such that it can be relied upon as a barrier for seven to fourteen days.

For areas, however, where it may be in short supply the researchers advise the farmer who is up against an attack by the bugs to spray the corn on which the bugs are found with any of the chemicals that will kill them until they can get a sufficient supply of dieldrin. Some of these insecticides that will kill the bugs but which, unfortunately, do not have the highly necessary residual action, are: Lindane or BHC used at the rate of 0.25 pounds of the gamma isomer per acre; parathion, 0.25 pounds per acre (watch out for this one—it is extremely toxic to humans); aldrin, 0.5 pounds per acre; or chlordane at 1 to 1.5 pounds per acre. These are Illinois recommendations. Your local authorities can give the approved recommendations for your state. Ohio recommends the use of two to four pounds of toxaphene in a barrier of 5% toxaphene dust.

If "C" Day occurs in your area this summer, the local extension people will have the latest information on controls. In the meantime, if you're in one of those territories marked out for severe infestation, start prayin' for Democratic weather.

FEEDING FOR AN EXTRA 1000 LBS.

(*Continued from page 45*)

pasture.

The pasture seed mix is the standard one used for hay at Brigham Farm; in fact, with the exception of those few fields seeded to alfalfa and brome, the fields are used interchangeably for hay, pasture, or silage. Brome, LaCoste thinks, is better for pasture than for hay. Reed's canary is poor in Vermont, and sudan grass "is for hungry cows." Ladino is the best pasture of all, and a good field of it can always be counted on to increase milk flow. Like all the rest of the 297 cultivated acres, pasture land is fertilized with 500 pounds of 5-10-10 annually. Manure is applied at the rate of five tons to the acre, but only to crop land, not to pasture. The manure, incidentally, is dropped through trap doors in the gutters of the cow barn into a manure celler. Here the pyramids of manure are held, in what is probably the most heavily ammoniated atmosphere outside of a nitrogen plant, until Spooner is ready to apply it to the fields.

Pastures are divided by electric fences into plots of 6 to 12 acres which hold 50 to 60 cows. "We let the cows decide when a pasture has been grazed enough." LaCoste told Trotter, "When the cows hang back and don't want to go into a pasture, then it's time for a change." Usually pasturing periods run about a week to ten days.

During May and June production stays up—the highest of the year. "But in July and August, then it goes down," LaCoste frowns. "The pastures are dry and the cows are hot and too lazy to get up from under the tree and eat. That's why our winter production averages better than summer." Some corn silage is saved for supplementary feeding during these hot months and hay is always kept in racks in the field. Brigham would like to irrigate a few acres, but the lack of water prevents him. Lake Champlain is only about two miles away but still too far for pumping, and the wells in the immediate neighborhood are not good enough.

Grain

In 1949, when the Brigham Herd became the only 100-cow herd in the world to average more than 600 pounds of fat—the official record was 11,703 pounds of milk, and 616 pounds of fat from 104 cows—the cows received an average of 3,397 pounds of grain, a ratio of one pound of grain to each 3.3 pounds of milk. "I swear, these figures give me an inferiority complex," Trotter said, "our herd average is 7,000 pounds of milk per cow and the grain ratio is one pound of grain to every two and a half pounds of milk—that's a real body blow to the milk check."

The Brigham feed is not expensive, as feeds go. When prices fluctuate the formula is changed to take advantage of lower priced feeds. Over the years the

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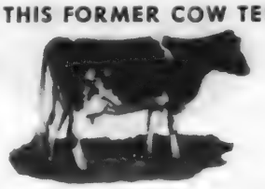

Success has been his reward! Charles J. Pritzl is now one of Idaho's successful farmer-breeders of Guernseys. Illustrated are some of the Guernsey cows, bred by Mr. Pritzl at his Prestdale Farm, New Plymouth, Idaho.

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protein content has been gradually decreased. It now runs somewhere between 16 and 17 per cent. Here is the current formula, which retails at about $5 per hundred in Vermont and slightly less in the Midwest:

200	pounds	oats
200	pounds	bran
200	pounds	hominy
100	pounds	distillers dried grains
100	pounds	corn gluten feed
100	pounds	linseed oil meal
100	pounds	soybean oil meal (increased to 200 if linseed isn't available
10	pounds	salt
10	pounds	bone meal
10	pounds	lime

The average cow in the Brigham herd gets 10 pounds of grain a day, a little more in the winter, when she gets it in three servings, and a little less in the summer, when the noon feeding is skipped and the pasture is good. The first-calf heifer may get a slightly larger helping: as Cesaire LaCoste says, "After all, she has three jobs to do—grow herself, grow a calf, and make 10,000 pounds of milk and 500 pounds of fat."

In the winter the dry cows and heifers get the same ration, minus a little protein, as the milking herd, though about half the quantity. In the best pasture season they get no grain at all.

Calves are weaned at 24 hours, fed whole milk for two months, then one-fourth whole milk and three-fourths skim milk for another month. They are gradually switched to a grain formula with a powdered skim milk base. The calves seem to have inherited a fierce appetite along with their dam's ability to produce. When the milk bucket is put in front of them, they jam their heads into it and drink furiously until the last drop is gone then fling the bucket off to the side and suck the whitened edge of their grain boxes, as though they were completely starved, until they are fed grain.

The very finest timothy mixed hay is kept before the calves at all times. If the season is right they are turned out to pasture shortly after vaccination at 6 months.

The herd sires get a formula of 80 per cent ground oats, 10 per cent linseed oil meal, and 10 per cent bran, with added salt, bone meal and lime.

Does It Pay?

Very often when people hear of the Brigham Farm their first comment is, "Oh, sure, Brigham can run a perfect set-up and break all the records, but don't forget to mention that he was President of a large insurance company, with plenty of money to back him up."

As a matter of fact, one of the members of the Board of Directors of the insurance company made about the same comment, though more elegantly, when he said as a joke, "Mr. Brigham, I wish that I could afford to support a farm."

Elbert Brigham's reply was direct and to the point. "It might surprise you," he said, "to know that I make more money per hour for my farm work than I do as

President of this company." It is true that the farm is one of the great pleasures of his life, for he was a farmer before he was an insurance executive and to run an unproductive, money-consuming hobby-farm would border on the indecent as far as he is concerned.

But the farm is no showplace. Most of the people who come to Brigham Farm are hard-working Jersey farmers like Frank Trotter, interested in the only showy item of the place, the cows.

They are something to see. Trotter, who is a skeptic when it comes to big production records, was more than half convinced that there was a catch somewhere in this 11,000-pound business. He changed his mind as soon as he walked in the barn door. The cows he saw were Jerseys, sure enough, but unlike any he had in his own barn or any he had seen in the show ring, even. Trotter's cows were about the same size as the national average for Jerseys, 800-900 pounds. But these Brigham Jerseys were big, they averaged a good thousand pounds, and some weighed over 1,300. A bit taken aback, he asked LaCoste if the increased feed costs for such big cows were offset by their production.

LaCoste is never one to mince words. "Would you be willing," he asked, "to feed your cows more if they produced 11,000 pounds of milk apiece?"

Some of this size, of course, is due to breeding (one of the present herd sires, June Volunteer Confident, weighs a whopping 1800 pounds). And some of it is due to management. But much of it is due to feeding. A Brigham heifer, for instance, weighs 600 pounds when she is bred at 15 months—100 pounds more than most heifers weigh at that age.

La Coste is proud of the big cows he manages. "These dainty little show Jerseys," he says with some scorn, "seven hundred pounds, maybe! I'd just as soon have a string of milking rabbits." Neither LaCoste nor his employer has ever taken a Brigham Jersey inside a show ring.

There are no blue or purple ribbons in the barn, but they will be glad to show the production records which are the pay-off in their breeding efforts. They are prouder of their 145 Ton of Gold cows, their 60 tested dams, and their 36 cows which have produced over 100,000 pounds of milk than they would be over a patchwork quilt of purple ribbons. And they are proudest of an old cow who, even in her best days, would have been waved out of a show ring on the first go-'round: she is J. Royal King's Quomage who, in 1951, became the Living Lifetime Production champion of the Jersey breed after producing 166,822 pounds of milk with 8,151 pounds of butterfat and who is still adding to her record. "Quomage, like all of our herd, made her record on twice a day milking under normal farm conditions," Elbert Brigham told Trotter. "We feel that the significance of our records lies in the fact that the entire herd—not

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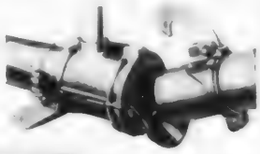

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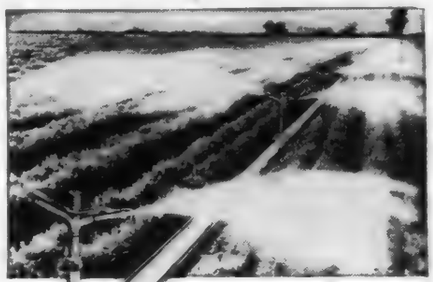

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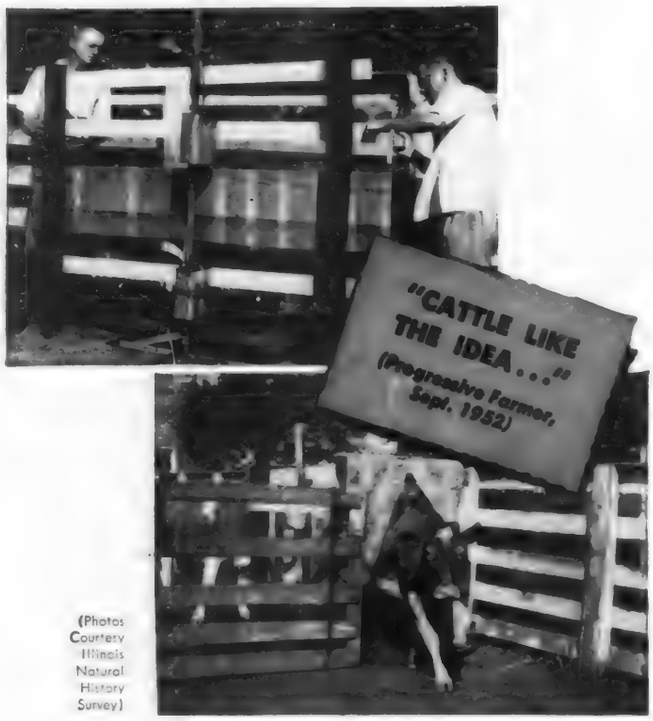

(Photos Courtesy Illinois Natural History Survey)

THE AUTOMATIC SPRAYER technique is one of the fastest growing developments in farm pest control. It was developed by the Illinois Natural History Survey and has passed the experimental stage with hundreds of sprayers already installed in all sections of the country. As the animal goes through the spray chamber, it steps on a platform which releases a measured amount of spray onto the animal.

It costs only 1 to 1½ cents per treatment with the proper Pyrenone* spray. And Pyrenone is ideal for the automatic sprayer because it presents no toxic hazards, it gives a quick knock-down and kill, it is effective on a wide range of insects including all species of flies, gnats and mosquitoes, and gives economical results. Pyrenone is the low-toxic insecticide approved for use on dairy animals, and of course it is equally effective on other livestock.

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just exceptional cows—was on test and contributed to the herd production record. We haven't pulled any cows off test when they faltered and we haven't stripped the leaves off the alfalfa to provide special feed for a comer."

When Trotter left the Brigham Farm he was convinced that the Brigham system with its emphasis on production was the best possible plan for the practical farmer. Like any other convert, he was determined to adapt this system to his own farm as soon as he could.

He began by dividing the field north of the barn into 10-acre lots so that he could change pasture every week or 10 days. Thin cows he put on corn meal feed to bring them back to good flesh. He rented 15 acres of alfalfa in order to have two kinds of hay to add variety to his feeding.

When fall came, he disced up two pastures that were mostly bluegrass and seeded them to a good legume and grass pasture mix, another field he put in alfalfa. All of the pasture and hay fields were fertilized. During the winter he fed clover hay in the morning and alfalfa at night instead of feeding one kind until he ran out of it. Because of the drouth last year he *did* run out of hay of both kinds, but kept up his variety feeding on boughten hay. Six more stanchions were added during the winter to provide for a total of 33 milking cows.

In the spring of 1953 Trotter bought a hay-chopper with which he will fill the silo with grass silage. He will also change his haying methods and use the chopper to pick up and chop the cured hay to be blown into the mow. He is also switching to the Brigham grain formula. During the summer he plans to add 12 more stanchions and to build his herd to 45 milking cows.

Sometime in the future he plans to build another silo for corn silage, install a hay drier in the barn loft, improve his roughage so that he can feed at the rate of one pound of grain to three pounds of milk produced, feed grain three times a day, and build up his herd to an eventual goal of an animal to the acre.

"Stretched out like that, it doesn't seem so difficult," Trotter says, "and it'll pay off—it's like Cesaire told me, 'A cow is quite a machine. If you take care of her, she'll take care of you.' "

THE AUTHOR: Janice Turner is the wife of an Orleans, Indiana farmer. She was graduated from Indiana University in 1945 and began her writing career as the editor of the Saturday magazine section of the Lafayette *Journal and Courier*. After three years she went home to marry John Turner and now combines writing with cooking and tractor driving.

FITTING AND SHOWING

(*Continued from page* 62)

minutes. The hay is steadily decreased and salt and mineral feeding are in line with normal farm practice. In summer a noon feeding is begun and one or two pounds of molasses-wetted beet pulp is included. As the fall shows near, the barley is cooked as an appetite stimulant. Besides adding palatability, it also tends to produce smooth, firm bloom. The cooked barley is fed in the same proportions as the rolled barley.

Since it is impossible to obtain silage while on the circuit, most showmen substitute beet pulp when they think succulence is needed in the diet. Showmen planning a long circuit often feed various kinds of hay so the cattle will not refuse whatever is sold on the road. Others, some days before leaving home, add a little molasses to the drinking water, repeating this at the shows so that strange drinking water is disguised. It's a labor of love for those who go to the top.

Kentucky Style

The Quisenberrys, J. H. and sons Tom, Henry and James, Jr., who hit the tanbark trail with some top Angus every year from their headquarters at Hill Crest Farms, Winchester, Kentucky, have no reluctance in disclosing their ration. Mixed hay is the only roughage they feed. Along with that their cattle get a mixture of 400 pounds corn and cob meal, 200 pounds rolled barley, 200 pounds rolled oats, 50 pounds bran, 30 pounds linseed meal and 30 pounds commercial supplement. The percentage of corn is reduced for older cattle.

The feeling among the Quisenberrys seems to be that it's not so much what you feed as how you feed it that counts. "Regularity is the main thing," they contend, "then you have less

feeding troubles. Every good cattleman feeds by the clock."

The Quisenberrys' small exercise lots offer only a limited amount of grass but help prevent the stiffness and sore feet often associated with barn-penned, full-fed cattle. The calves spend their summer days in a darkened barn, free from heat, sunburn and fly annoyance. They go out only at night and are never allowed to run with their dams or to have access to grazing. The Quisenberrys feel it is impossible to fit on pasture.

"We let them nurse twice a day," the elder Quisenberry explains, and except for combining that with a little leading and whatever training we can squeeze in, that's all the time we can give them until nearer the fall shows. Farmers like us aren't in a position to do as well as we know how or could do if we didn't have a crop to get out. Tobacco is a 13-months-a-year job."

Training

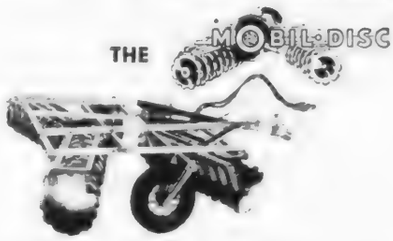
Training begins with halter breaking, obviously as a calf. The animal is tied up closely for increasingly longer periods daily, to make it halterwise.

Attempting to drag your calf behind the tractor just won't work. Lead the calf to a purpose he can understand—leading him to suckle is best. After he has nursed you will probably have to drive him back to his pen, but eventually you'll be able to make the round trip, holding the rope short with the calf's head beside you and trying for a slow gait so he is more readily posed when halted.

After supper of a summer evening when the heat has let up a bit, serious training gets under way at Hill Crest Farms. The Quisenberrys use a yardlong stick with a projection or a nail on one end to pose their calves, tapping a leg back if needed, or catching the nail behind a dew claw to advance a hoof. Later a show stick is employed, but "they are not meant to be used as clubs." The calf must be taught to halt gracefully when and where desired, to back up with hand pressure on his shoulders and to stand posed in one spot a dozen or more minutes, as he will have to do in the ring. A touch under the belly will in time teach him that he should come up from a slump and a pinch on the back will cause him to raise a low rump.

Coat Care

Then there's the daily brushing and hand rubbing to glossen his coat. In the beginning a currycomb and soft brush will remove dirt, scale and old hair. When his confidence is completely gained, he is ready for washing. Though some believe weekly washing in warm weather promotes hair growth, a few times during the latter part of the fitting is enough. The dirt is dry-brushed out by stroking with the hair. After wetting, a mild soap lather (castile is a favorite) is worked into the coat with a stiff brush. Then he is rinsed, the ears being held down so no water enters them



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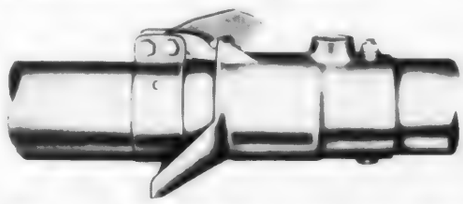

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and the excess water is scraped off with a flat stick or the back of a scotch comb, which is really only a comb on a forked handle. The next rinse is a weak dip solution to clean the skin and soften the hair. Drying is completed by combing again, pulling downward. White markings can be rinsed in bluing water: manure stains respond to weak household bleach. Now the calf is rubbed with a fresh cloth, rubbing with the hair, and the ears are cleaned lightly inside. The switch is prettied up by combing. By that time the proud owner is ready to step back and admire his handiwork.

Clipping is preferably done several weeks before showing to overcome bristling. Too frequent clipping produces coarse hair. Naturally polled or dehorned steers should have their heads clipped to give a clean look, but horned cattle are never clipped around the head. The tails of all steers are clipped from the break in the twist to a blending at the tailhead.

Hooves and Horns

Experienced showmen check feet regularly. Badly shaped hooves affect the gait and the set of the legs while posing. Many a becoming walk has offset a minor fault of conformation in the ring, and a clumsy walk will seriously hinder the chances of a top individual. No judge can ignore a graceful animal. If much hoof trimming is needed, it is not wise to correct it all at once but to trim over a period of four to six weeks before showing so that if lameness develops there is time to remedy it.

While most stockmen prefer nippers, all that is needed is a wood chisel, knife and rasp. First the toes are snipped or chiseled and rasped smooth. Then the sole is leveled with a knife so the animal can stand flat without rocking on its heel. Sore feet should be treated with cresol, with ointment applied to any cracks. The hooves can be polished like the horns: clear shoe polish can be used.

Horns are best trained in animals between 12 and 18 months old. Light rasping on the outcurve, combined with daily hand pressure, aids shaping. Light weights and devices, available in many forms, should be used sparingly and not permitted to mar the horn where attached. They must be removed as soon as the proper curve is achieved. Naturally horned breeds are shown with horns, except in the case of steers.

Beef Classes

Along about this point in the fitting and training operations, the potential exhibitor begins to ask himself where he is going to show. That means the time has come to put out your requests for premium lists so you can study the offerings and plan your campaign.

To enter all classes at the average state show would take a herd of about 14 head. Steers are grouped by weight and age limitations. Breeding cattle are classed accord-

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Moves Hay Faster Than 2 Men Can Barn It!

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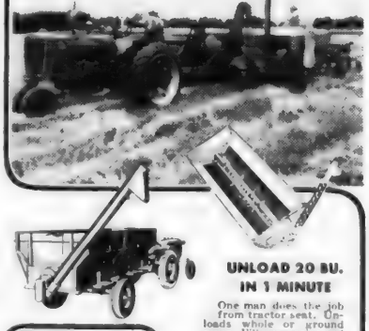

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Dept. 145 Columbus, Kansas

ing to age, with reckoning dates in general as follows: Junior Calves, calved on or after January 1 of the year shown; Senior Calves, calved September 1 or after of preceding year; Summer Yearlings, calved May 1 to August 31 of preceding year; Junior Yearlings, calved January 1 to April 30 of preceding year; Senior Yearlings, calved after May 1 two years before; and Two-Year-Olds. These are in both bull and female divisions. More than one entry can be made in most classes. Winners may compete for junior and senior championships, which in turn vie for grand champion, the second best usually being designated reserve champion. Many of these awards are repeated in classes for junior exhibitors.

Fat steers needn't be purebred, though it naturally takes top breeding to respond to the treatment given winners, stoked to the gills as they are from birth to a high-priced end. In this group the 4-H youngsters are offering stiff competition everywhere, even in open classes. Billy Bradford of Colorado City, Texas, a city lad, in January of this year, with no previous cattle experience whatever, fitted and trained one steer, taking it up the ladder in the Ft. Worth Fat Stock Show to the grand championship of the junior division and reserve championship of the open show. And 15-year-old Faye Mugge, a club girl of Cleghorne, Iowa, sold her Angus steer "Shorty" for $1.50 a pound at the 1952 International, after winning the junior show grand championship and placing third in the open steer class.

However, these isolated instances are the rule-proving exceptions. The premiums are most consistently won by the breeders who have to win to maintain their prestige and sales.

Doug Gay, a neighbor of the Quisenberrys at nearby Pine Grove, Kentucky, and a big name among Hereford breeders, knows what it takes to make a champion and the obstacles that stand in the way of the newcomer.

"A beginner can burn up a steer," he says, "tear up his bowels. You're in trouble if you feed over 10 per cent protein. Why, we feed straight timothy as our hay because it isn't so laxative. Sometimes, though, we feed a little alfalfa when the animals get constipated on the circuit. Experience has to be behind a winning combination and you'll usually find a relative or a club advisor or a county agent has had a considerable hand in directing the long-shots. No, I don't object to it. I'm glad they turn to expert advice. I did the same."

In the bigger expositions, the stock commonly arrives a day or more before public opening and is washed after being rested. Clipping is done if needed. The night before ring call, the switch is washed, using a little bluing if the tail is white and followed by a water rinse to which a bit of alum has been added for fluffiness. For an

Irrigation News

WEATHER: Made-to-order!

FROM ALUMINUM COMPANY OF AMERICA
Member of Association of SPRINKLER IRRIGATION EQUIPMENT MANUFACTURERS

VOL. 4 NO. 4 SUMMER—1953

WISCONSIN FARMER IRRIGATES ONCE... TOPS COUNTY AVERAGE ONION CROP 75%

Mr. Scheckler also irrigates his potato crop with Alcoa Aluminum Irrigation Pipe and gets amazing results. Here he covers 30 rows to a setting.

Racine, Wisconsin—The importance of irrigation, even in areas that average high in rainfall, was confirmed recently by local grower, A. W. Scheckler. Here's how he explains it:

"After a 3-inch rain, we had 3 hot, dry weeks which caused a heavy crust to form on 15 acres of muck—planted to onion sets. This seed was irrigated once and a crop 75% above the county average was obtained." So, even though the *average* rainfall in the area was good, sprinkler irrigation supplied water *when it was needed*. As a result, Mr. Scheckler's crop was far superior to those of his neighbors who did not irrigate.

Mr. Scheckler, whose farm is located on Route No. 3, Racine, has a portable sprinkler system, using Alcoa Aluminum Irrigation Pipe. Regardless of the prevailing weather, he *knows* his system will be "of great value each year."

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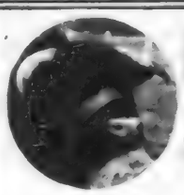

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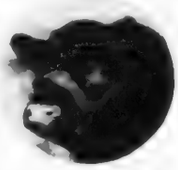

Because prices for Shorthorns or Polled Shorthorns are always sensibly and honestly in line with business conditions. No plunging, no speculation, no boom or bust with SHORTHORNS and POLLED SHORTHORNS! Their sales are on a solid foundation, and the breeder is today running his business as he has always done — for sure and guaranteed yearly PROFIT.

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even whiter switch, it is dipped in a milky solution of whiting.

Show Day

If you follow the older method, on the eve of the show you'll probably put a handful of salt on the grain, and withhold all water. Show morning, the grain is followed with a little beetpulp, fed at intervals. An hour before showing, feed a trifle more beets and only enough water to round out, short of bloating or distortion. You don't want the big fill often given dairy cows. And you will avoid the tricks, such as feeding a half dozen bottles of beer, which is still occasionally seen. Overfilling causes sluggishness, which the interval feeding is meant to thwart.

The curling job, which should have been practiced long before this eleventh hour, will need redoing now because it doesn't hold up very long. Long-haired animals are usually curled or waved all over, except that in the case of Aberdeen Angus the practice is generally confined to neck, shoulders and thighs. First the hair is wetted with a little dip, and is parted along the top line. With a lining comb, ridges are drawn along the sides no higher than the widest part of the back. Veterans disagree as to the best direction of combing. Some insist, because the hair tends to grow backward, best effects come from beginning the strokes from the thigh; others, for the same reason, prefer to begin the motion at the shoulder. Regardless, the real movement as in all accomplishments, begins deep down in the heart.

After the hair is somewhat dried, it is combed or brushed *upwards* to produce the curled appearance and to blend with a back widening effect where it meets the broadest part of the back, which is brushed flat. It takes a lot of arm work to set the hair and an electric brush comes in handy here, but it adds inches to width and smooths uneven conformation. This is but one of the simpler fashions of dressing, which is completed sometimes with an oil spray, applied with an ordinary household fly gun. Spraying must be kept to a minimum so the hide is not greasy to the judge's touch. If kerosene-diluted sweet or olive oil is used, it must be washed out directly after the show or it will cause blistering.

Into the Ring

It is time to fluff the tail, holding the end and brushing upwards in fluffing it out. At last you can put on the leather halter you've been saving and you're ready for the ring. Walk on the left of your primped baby as you enter the arena. "Don't over-show yourself, show the animal," Prof. Purdy advises, "but go in showing. Don't communicate your own nervousness to the calf. Many a ribbon has been lost by a superior animal because it has been poorly shown."

Pull into line beside the entry ahead of

PERHAPS YOU, TOO, CAN GET A 70-lb. Heavier Calf* for a Lot Less Cost

NURSING CHOW, Purina's New Milk Replacer, Makes a Big Difference...

*Most dairymen's Holstein calves, according to Morrison's "Feeds and Feeding," weigh 250 lbs. at 4 months. Compare that with 320 lbs.—the average 4-month weight of Holstein heifers fed Nursing Chow and Calf Startena on the Purina Research Farm during 1952. (Bull and heifer calves together averaged 326 lbs.)

Take a look at the calf on the left above. She represents the average weight of her breed at 4 months. On the right is a Purina-fed calf at the same age. Which will make the better cow?

NOW LET'S CONSIDER COSTS

If the calf on the left got an "average" ration, she consumed:			Here's the ration for the calf on the right:		
Whole milk	1770 lbs. at 5¢	$86.00	Purina Nursing Chow	25 lbs.	$ 5.50
Grain	200 lbs. at 4¢	8.00	Calf Startena	450 lbs.	31.50
Hay	150 lbs. at 1¢	1.50	Hay	125 lbs.	1.25
	TOTAL	$95.50		TOTAL	$38.25

Prices in these rations are estimates of nationwide averages and may vary up or down in your community. The relative cost of these two rations, however, will remain fairly constant.

Look at the cost of Nursing Chow and Startena together. Less than half the average cost of the whole milk they replace. And besides that, antibiotics in Nursing Chow help keep down nutritional scours, our research has shown.

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you and immediately pose your animal, facing it, with the lead in your left hand and the show stick in your right. Without fussing, use your comb or brush to touch up the consequences of animal contacts. The judge is coming your way, handling each entry, and he has only a few moments to size up the results of your months of labor. As the judge examines each side, turn the calf's head in that direction to exhibit his head and neck to best advantage.

When all entries have been handled, the judge will take the center of the ring and the cattle will be walked in a clockwise circle around him. Keep a weather eye on the judge, but don't neglect your entry. On being instructed to stop "head-to-tail," the calf should be set up at once and never let fall apart: he has been fed and curried and polished to his best—now the showman is on trial. In the split second the judge may glance your way, you can win or lose the show.

It may be necessary to relax the calf or he won't be able to pose when the judge is in your neighborhood, but just because your calf isn't waved into one of the first few places at the head of the line is no excuse for letting him go into a slump. Changes in decision always occur. The veterans put it this way, "The show is never over until the ribbons are tied." For the most part, the competition will be keen and clean and you can feel that any premium won has been well earned.

That's all there is to it. You don't need a champion to share in the profits. The shows offer every exhibitor a tremendous amount of inspiration. The cash awards are seldom large, but the glory is priceless.

THE AUTHOR: C. Chester Charles was a writer with Harper & Brothers prior to the war but kept his hand in the rural scene with a one-pig, one-cow farm in New Jersey. After a period in service as an army psychologist, he returned to midwest grassfarming. He now divides his time between free lance writing and raising Shropshire sheep and Hereford cattle on a southwestern Ohio farm.

SCREW-WORMS

(*Continued from page* 47)

appeared suddenly in Iowa, Illinois, South Dakota, Indiana, and New Jersey. The somewhat cooler climate is a welcome change from the hot mid-summer weather farther south, and that combined with the fact that they are new to these areas and go unrecognized by stockmen, means they usually do a land-office business and tremendous damage before they are controlled.

Life and Habits of Screw-worms

Taking a look at the life cycle and habits of the screw-worm makes it clear why they are public enemy No. 1 to stockmen in their native regions and why even one overlooked screw-worm case can cause a sizeable outbreak in more northerly states if given half a chance.

Take the case of the calf the riders just doctored. A cruising screw-worm fly, a bluish insect with black stripes down its back and a patch of orange between the

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eyes, was attracted by the blood of the navel wound. In short order she swooped down and deposited about 200 tiny, very white eggs in a neat shingle-like mass on the edge of the wound, cementing them to each other and to the calf. This is the mark which distinguishes the screw-worm fly from other blow flies which lay yellowish eggs rather haphazardly in a heap.

Since the day was warm and sunny, in about 12 hours the little maggots hatched, covered with rows of dark-colored spines which give them a screw-like appearance. They come equipped with a ravenous appetite and immediately start feeding as a colony, standing on their pointed heads, rasping away at the flesh with their mouth hooks. As the wound gets deeper they back up occasionally so that the blunt tail end through which they breathe reaches air.

If the infested calf hadn't been found, the screw-worms would have continued feeding, developing rapidly, becoming full grown in about 5 or 6 days. By that time one colony would have eaten a pocket about the size of a lemon, but chances are they would not have had the wound to themselves. As it becomes older, a wound becomes increasingly attractive to other flies which deposit more shingle-like masses of eggs. These colonies hatch and invade the wound ready to take over completely when the first batch matures.

The maggot, pinkish colored when fully developed, then crawls from the wound and falls to the ground where it digs in, shrinks its body, and enters the pupal stage. In warm weather this change from larva to fly takes about a week. The fly then breaks open the hard brown pupal case, wiggles to the surface of the ground, and climbs on a twig to spread and dry out its wings. Within an hour it can fly away. Two or three days later the female mates and in another three or four days is ready to lay eggs. Its work isn't done once a batch of eggs is deposited, however, for the fly can still develop more egg masses and go on ovipositing for two or three more weeks, when she dies of old age, survived by several hundred offspring and mourned by no one.

A very young calf, because of destruction of tissue in as vital a spot as the navel and the toxic effect of a secretion by the worms which prevents healing of the wound, lasts but a short time if left untreated. If it survives, whether by sheer stubbornness or by treatment in the nick of time, it still has been set back considerably in development due to loss of appetite and nervousness caused by the infestation.

An older animal, without a mammy to keep an eye on it and bawl it to her side occasionally, may stray from the herd and hide out in the brush so that finding him is a tough job, even with dogs. The animal loses appetite, becomes nervous and makes frantic efforts to scratch or lick the wound. The wound becomes bigger as it is reinfested and finally gets the animal down.

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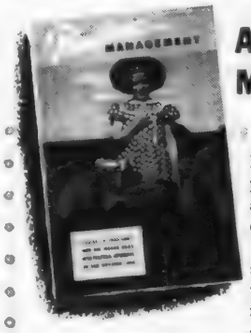

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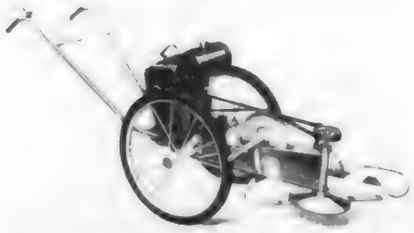

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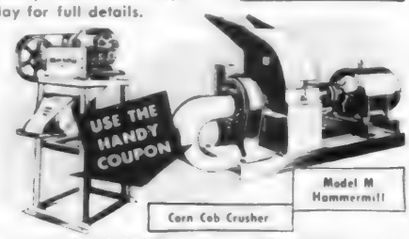

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Buzzards wheeling lazily over a thicket usually points him out to riders too late.

Control

What is being done and what can be done about the pest? When it comes to screw-worms, any stockman will tell you that an ounce of wound prevention is worth more than the well-known pound of cure. Since the screw-worm has increased mainly from a large number of wounds in livestock during the winter months in southern Texas and southern Florida, reducing this number is the first step toward effective control. The fly has no real dormant state and cannot survive for more than a four-month period without producing at least one new generation. If the livestock management system were changed so that the birth of young and all wound-making work were suspended during the critical over-wintering period, the screw-worm would be hard put to survive.

The chart on page 47 shows a schedule recommended by the Bureau of Entomology and Plant Quarantine for all wound-making operations and the dropping of young in the key overwintering area in south Texas. In the more northerly sections of the state, Oklahoma and other adjacent states, necessary surgical work should be done and all young should be dropped during the periods when the fly is completely absent. Similar practices should be followed in Florida and the Southeast. The exact dates best suited for such work in a particular area can be obtained from your extension service.

Just as there is more than one way to skin a cat, there are several other ways to deprive the screw-worm of a breeding place. Young cattle should be dehorned early, using a caustic or one of the new electric dehorning irons, and the horns of mature stock should be tipped to prevent wounds from fighting. Stockmen who stick with the clamp-type emasculator or rubber rings have fewer cases to contend with.

Goats should be dehorned when from two to five days old, using caustic or a hot iron to prevent blood showing. Then the wound should be kept covered with a smear until completely healed. Goats and sheep both should be castrated with the clamp or the rubber ring. Little blood is lost when the Burdizzo-type clamp is used for docking, too, cutting between the joints. Long-comb shearing equipment causes fewer cuts on sheep and goats and thus keeps down screw-worm infestations.

Hogs offer a special problem in that a clamp or rubber ring cannot be used successfully for castrating. The job must be done by cutting. In this case, the only thing to do is schedule it out of screw-worm season if possible and in any season keep the wound well covered with a smear until it is completely healed. Hog men had best pull the tusks of older boars and the eye teeth of suckling pigs as another means of avoiding infestations.

In general, fences, corrals and chutes

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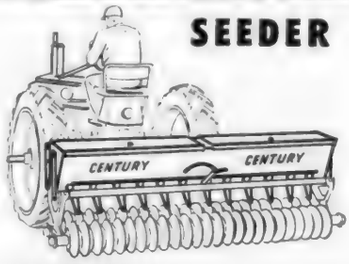

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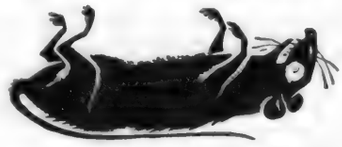

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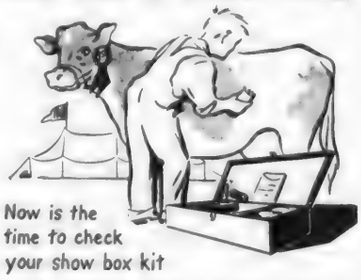

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should be kept in good repair so that animals are less likely to snag themselves. Injuries can be further avoided when handling stock by easing them through gates and gaps and by not pushing them too hard through brush. Dipping or spraying with one of the new insecticides such as a 0.5% toxaphene or a mixture of 0.5% DDT and 0.025% lindane will control ticks and any biting insects which injure stock or worry them into injuring themselves.

Immediate treatment of all unavoidable wounds and continued treatment until wounds are healed runs a close second in control methods. The navels of new-born animals should be swabbed with iodine followed by an application of screw-worm remedy soon after birth. When stock is being worked or sheep sheared the best practice is to keep a "dope bucket" handy so that all wounds may be coated with smear before the animal is released.

Treatment

Many medicines and nostrums have been used for treating and controlling screw-worms since stockmen first came up against the pest in the early days. Everything from common salt, dried horse manure, boiling water, and strong caustics to complex chemical formulas have been tried and found wanting.

After years of experimentation and testing the Bureau of Entomology and Plant Quarantine found that benzol was an effective screw-worm killer and that diphenylamine, a powdered chemical, was a good protector against infestation. Researchers worked out a method for combining the two along with turkey-red oil and lampblack and introduced the mixture in 1941 as Smear 62. During the war when turkey-red oil was in short supply, another formula, Smear 82, was recommended as an alternate. Although highly effective, both are quite volatile, not as long-lasting as might be desired, and caused many a permanent blue-black stain on Levi's and leather.

Recently a lindane smear has been introduced by the USDA which is recommended as a supplement to the older remedies. Called EQ-335 it does not stain, is not highly volatile, and has proved more effective in preventing infestations than either "62" or "82." Most important, however, is the fact that EQ-335 will kill adult screw-worm flies visiting wounds that have been treated with it.

All the smears are best applied with a one-inch brush. Uninfested wounds should be given a light coating to make the wound less attractive to flies. In treating the infested wounds it is not necessary to remove the larvæ except those near the surface. The smear should be worked well into the wound, however, giving special attention to any deep pockets made by the worms. The area completely around the wound, especially the drainage area, should be

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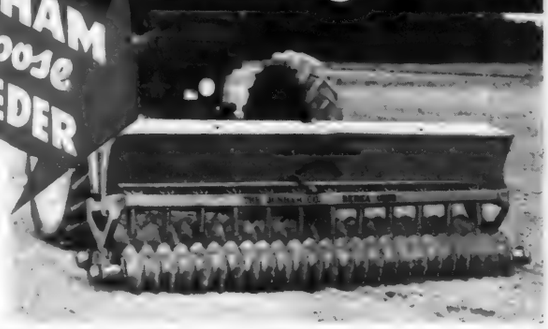

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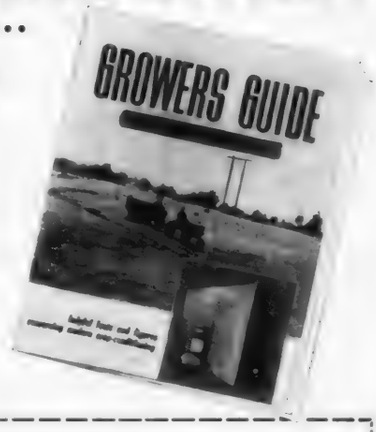

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given a light application as well. Merely pouring or squirting a liquid remedy into the wound sometimes fails to kill the deeply pocketed worms, so this remedy should always be worked into the deeper areas of an infested wound.

A word or two of precaution is offered by the USDA. The minimum amount of EQ-335, or any other lindane preparation, necessary to treat the wound always should be used. Baby calves are particularly susceptible to lindane, but the navels and any other wounds of new-born calves can be treated with complete safety if no more than 2 or 3 teaspoonsful of the remedy are applied at one time.

Outlook for Summer

What will the screw-worm situation be this summer? That is a secret locked up in the southernmost counties of Florida, Texas and other border states. This spring, and every spring since 1943, the Bureau of Entomology and Plant Quarantine has conducted a screw-worm survey in overwintering areas in an effort to determine just what stockmen could look forward to in incidence and relative abundance of screw-worms.

According to the official report, although there are fewer flies due to the dry weather, they survived about 150 miles farther north than usual because of the mild winter. That means that north Texas and Oklahoma ranchers and stockmen in northern Florida had better keep a sharp eye out for worms earlier than usual. This wider-spread winter survival also indicates that screw-worms got a good early start in migration and are likely to get much farther north than usual before cooler weather sets in this fall.

The latest control method the Bureau has come up with is the use of radioactivity in controlling flies. Laboratory experiments at Kerrville, Texas, proved that the screw-worm flies could be sterlized with either X-rays or gamma rays from radioactive cobalt. In this case if a normal female, which mates only once, mated first with a sterlized male fly, she would not mate again and would lay only infertile eggs the rest of her life. If a considerable number of sterlized flies were released, then technically the population of screw-worms would be reduced or even stamped out.

"There is a chance that this might be the answer to the screw-worm problem," says R. C. Bushland of the Bureau of Entomology and Plant Quarantine, Kerrville, Texas, "but only in Florida and the southeastern states where there are comparatively few screw-worms in the winter and where the areas are isolated from invasion by foreign flies."

Since there isn't any sure-fire way of getting rid of this pest, livestock men are hard at work with the next best thing, keeping them under control with good management and prompt and proper wound treatment.

DISHWASHERS

(*Continued from page 77*)

When the water is "soft", that is, about two grains hardness, then a moderate amount of detergent per load will give the best results. As the water increases in hardness, however, it is necessary to increase the amount of detergent used. When this amount builds up to more than two level tablespoons, stop! With these soapless detergents used by the dishwashers it is not a case of "If two are good, three are better." Too much detergent causes spotting and clouding of glasses and other dishes just as too much hardness will do and is not the solution to the hard water problem.

According to recent tests made by dishwasher manufacturers, Thanx and Finish, detergents produced by the makers of Calgonite and Electro-Sol, do a good job of removing hard water liming and the reddish-brown film which is caused by too much iron in the water.

If water hardness is 15 or more grains, then a water softening system is the only answer to good dishwashing results and normal housekeeping efficiency. You can check the degree of hardness at the local water bureau or with a water softener dealer who usually offers a free service in testing water to determine mineral content and degree of hardness. In an area where the mineral content in water is a problem, the split water system is ideal for dishwasher installation. Drinking water comes from a well or spring and a cistern with a pump of its own supplies water to the heater.

"When we installed our dishwasher four years ago," says Mrs. Lee Worthington of Ohio county, Indiana, "I must confess I was a little worried about how it would fit in with our water system which depends on a cistern for our house supply. Even though the cistern is a good size one, we have always been careful with the water, like most farm families have to be, cautioning the children to use it sparingly. I have been a little amazed at how well it has worked out. 'Only in mid-summer has there ever been even a hint of a shortage—which is pretty normal anyway—and certainly there is no hard water problem.

"Our electric hot water heater has always supplied plenty of hot water for the dishwasher, too, even though my washer isn't the type that has its own heater. I fully expected to have to do some arranging with my hot water usage, but this has never been necessary, even when I was doing a couple of loads of clothes in my Maytag at the same time.

"Some time ago we put in an extra fuse box in the basement to take care of such extra electrical loads as the water pump and heater, the dishwasher, and any other appliances we wanted to add from time to time. The dishwasher has a circuit to itself, but since it was installed right next to the sink, it didn't need a separate drain."

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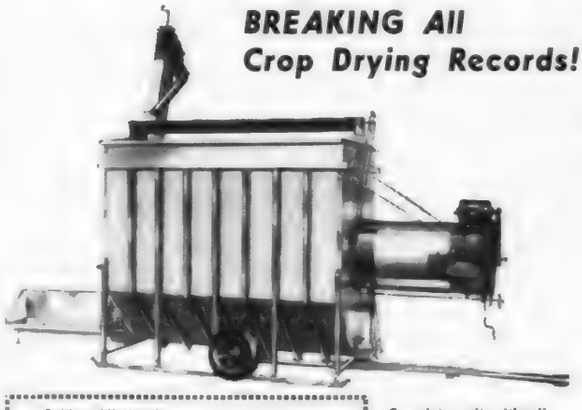

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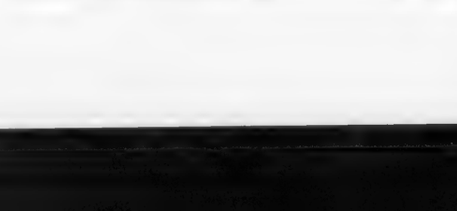

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Dishwashers, designed for simple installation, usually require standard plumbing and drainage setups. Since only hot water is used by the machine, one supply line from the water heater is all that is needed. When placed side by side with the sink, they are designed to connect into the sink drain and use the common trap. Westinghouse and Hotpoint have ironed out most installation problems with a special tail piece and pump operation. The pump in the machine pumps the water from the dishwasher up to a level of approximately the bottom of the standard sink. Then with the new piece, which replaces the tail piece hanging from the sink, a connection may be made between the dishwasher and the sink drain line by making only two solder joints. It is not necessary then to relocate the drain line entering the wall.

Where a cabinet separates the dishwasher from the sink, the dishwasher drain may be extended to empty into the sink drain: however, where it is located some distance from the sink, whether built in with the cabinets or free standing, a separate drain and trap must be installed to accommodate it.

In the city, local codes require special wiring to the dishwasher from the fuse box. The manufacturers suggest that while it is a good idea to provide a special branch circuit for the dishwasher in the farm home, it is not an absolute necessity. There are many occasions, for instance, where the dishwasher is being operated from the circuit used to provide light in the sink area. If a circuit is available near the sink, or any other area where the dishwasher is installed, then the connection might be made to this circuit. The limiting factor, of course, is the number of amperes that line is carrying at the time. If all the kitchen circuits suitable are already heavily loaded with appliances, then a separate circuit is the only answer. This, however, is only a 115 volt supply circuit and should be good for 15 amperes. A No. 14 wire with a 15 ampere fuse or a No. 12 wire with a 20 ampere fuse will do the job. This is run to an outlet box usually mounted on the wall behind the machine.

Manufacturers and users alike offer some suggestions for getting the most from your machine. "In preparing my dishes for the washer," says Mrs. Worthington, a careful scraping with one of these rubber spatulas is usually enough when the dishes go right into the machine for immediate washing. If I plan to let them stand for a while, though, I rinse them slightly before putting them in the machine, because dried and hardened foods just won't completely come off."

Although loading dishwashers is a simple task and easily done, improper loading can mean poorly washed dishes through blocked and badly distributed water. Incorrect loading or overloading may also cause spotting of silver and glassware. The loading of the dishwasher may be one factor which determines whether or not pots and pans clean well. All manufacturers declare that even these can be washed sucessfully in the dishwasher, but when large or oddly shaped

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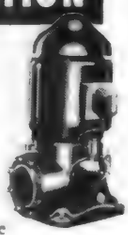

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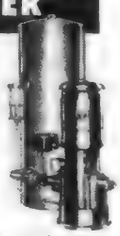

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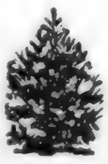

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pans and dishes are placed in with the regular load, the results are usually not as good as when they are washed separately in a second load.

Some dishes cannot be washed in the dishwashers: they are not made to resist the high temperatures used by the machines. Certain plastics used in dishes, handles and kitchen gadgets are best washed by hand, unless they are marked "Heat Resistant," which certifies that they have passed the test.

"The manufacturers say that fine china that is commercially glazed, whether it is hand-painted or not, can be washed safely in the dishwashers," Mrs. Douglas says, "but I have always hesitated to put my good Havilland in and have never washed it anyway but by hand."

Poorly fired or baked porcelain glazes on china will tend to craze—develop a fine network of cracks in or beneath the surface—on aging, even at room temperatures, so they are even more susceptible to crazing when washed in hot water. Those heirloom plates which are hand-painted and are so old that you can't be sure just how they were glazed, are best washed by hand, too, because even the best pigments have a tendency to fade when washed in hot water.

Even with these precautions which must be taken, the odds are very much in favor of washing dishes by machine rather than by hand. And the use of the dishwasher need not end with the daily dishes. Many farm women have found that their dishwasher does a good job of cleaning the awkward cream separator and does a fine wholesale washing job of the mason jars and jelly glasses at canning and preserving time.

As a final word in favor of dishwashers, one enterprising university research group discovered that the average housewife spends a month and a half each year at the sink, washing six tons of dishes which would make three stacks as high as the Empire State Building. This accumulation over 50 years of housekeeping presents a strong case for the automatic dishwasher.

THE FRIENDLY MEAL

(*Continued from page* 60)

of sugar and spices in the cored interior had formed a jelly-like substance which would be enriched by a splosh of thick cream. Or apple sauce from the Mackintoshes, winesaps, transparents and red Astrakans growing in Uncle David's orchards. He was an easy mark for every nursery salesman who drove his buggy into the farmyard and always bought some new variety for the upper or lower orchard.

There might be salt pork and baked potatoes, the pork, after being cut in neat squares, floured and browned to a crisp; the potatoes mealy and white as their jackets were parted. Baked beans? Say,

Tokheim Model 40 Electric Pump. Available with or without meter.

Tokheim Model 782 Air Compressor with wheel assembly 10 gallon tank.

Tokheim Model 966 Double-Action Hand Pump. 8-foot hose and nozzle.

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The new Bean-FMC Haymaker at work in a field. Cuts hay in a seven-foot swath, then cracks the stems to speed drying time without losing the juice of the plant.

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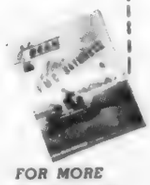
Haymaker Hay is higher in nutrients, and vitamin content. Faster drying of Haymaker Hay reduces the time your hay is exposed to sunlight and heat, thus saving that valuable Carotene (Vitamin A) present in the most nutritious hay. Haymaker users find that leafy, green Haymaker Hay actually permits important savings in supplementary feeds. Livestock find Haymaker Hay tender and more palatable, they eat more of it.

REDUCED FIELD DRYING TIME CUTS WEATHERING LOSSES

Since the Haymaker cracks the stems they dry almost as rapidly as the leaves. This cuts field-curing time in half. In fact, it is possible in good haying weather to make hay in one day. This reduced curing time sometimes makes it possible to get an extra cutting.



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A Division of Food Machinery and Chemical Corporation.

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Es-Min-El is now available in spray or dust form. If you haven't mineralized your soil, you can now feed these minerals to your plants through the leaves and stems. Es-Min-El spray or dust is a neutral form of Copper, Manganese and Zinc.

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take some of Grandma's yellow eyes flavored with molasses from the big brown jug in the buttery, given a long, unhurried baking in her chubby bean pot.

Another Vermont favorite was baked peas. The dried peas would be soaked overnight in water drawn from our well.

Then after a cautious parboiling with a fleck of soda in the water, these would be removed from the stove at a strategic moment and placed in a covered blue baking crock with a wire bale handle. Maple sugar would be added, and a moistening of water: by some a final pinch of ginger would be sprinkled over the concoction. Add great squares of fresh pork and there you have it.

When Uncle Frank, who had a large apiary, stopped by for supper with us, he often came bearing a comb of fresh bees' honey. This made a tasty side dish to be served in a deep saucer. You ate bees' honey as a luxury—not freely, as in the case of maple syrup.

On occasion, I was the provider of a supper dish. Peristently, except for the diversion of momentarily snaring a spring azure butterfly or a gay clouded sulphur —I had picked tiny wild strawberries from open fields close to home. On receiving these, Grandma shook them into a brown-flowered Ironware berry dish, carefully picking out the grass and weed seeds. High bush blueberries were also a supper favorite as they bobbed about in saucers abrim with heavy cream. Later in the summer came raspberries and blackberries.

In deep summer we sat down before lighting-up time. But in northern Vermont that period in the summer was always far too short. Most of the year the last meal of the day was eaten under the soft glow from kerosene lamps. The stove, if its grating stood open, offered a separate flicker of fire, that danced in my Grandmother's gold-rimmed spectacles. Both house cats dozed lightly in their basket. The big kitchen rocker still swayed gently where my Aunt had just shoved it aside at the call to table.

Beyond, in "the new barn," built some 20 years ago, the cows' soft, contented moos echoed back and forth, while all the farm creatures settled down for the night. My uncle's little Morgan mare whinnied engagingly. Thrushes sang their resonant vesper song.

At first we ate briskly and silently, as farm families do, content with the knowledge that a second, even a third helping was wholly in order. Presently inconsequential bits of news were exchanged. I told of some exciting adventure which only made my elders smile indulgently. A sense of completeness settled upon those round the plain spruce table with its dark finish. Another day was reaching its peaceful close.

Grandma, still following the fashion of her girlhood, had turned her tea from the cup into the big saucer from which she

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50	$1.80	$1.95
100	3.00	3.40
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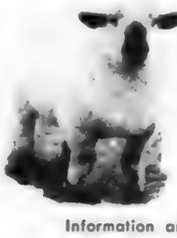

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sipped it. Uncle David, resting his weary feet for the first time since breakfast, tilted his oval-backed chair against the wall. Our hired man unloosed the drawstring of his cambric tobacco pouch and twisted his pipe around to fill it with Hard-a-Port cut plug. Aunt Nancy Howard smiling, smirking to herself, relived an evening with an old beau of sixty summers back.

Below the porch, and beyond the south pasture, stretched row on row of purple-shadowed mountains. Deep farm quiet lay upon the countryside. Save for faint sounds from farms a half mile distant, this stillness went unbroken. Daylight dwindled away. We sat encircled now by friendly beams from our unshaded lamps. Tomorrow would be another today—unless, perhaps we were working in some far field, then Grandma might blow the old dinner horn to summon us from our tasks. This was a rare instance, my inner man being all the dinner horn *I* required.

THE AUTHOR: J. D. Frye of St. Johnsbury, Vermont, who wrote "The Friendly Meal," had only to draw on his memory for the days he spent on the Vermont farm in the '80's. He says: "Often I repicture the evening meal at the old farm; it gives me much pleasure. Now that I have gotten through my 85th winter (for I had to winter before I summered and I didn't winterkill that first year) I'm looking forward to seeing the old farm again with its summer trappings."

PICKLING TIME

(*Continued from page* 73)

good living of the grower and his family. Now it has vined-out into a big cash crop.

There are just four basic pickle types—dills, sours, sweets and quick or overnight—from which the countless pickle variations are derived. Three main dill types are made. The Genuine dill is produced by putting fresh picked whole cucumbers into a brine flavored with dill and spices, and cured by natural fermentation. They are made both at home and commercially. Processed dill pickles are started in strong brine and finished later in dill solution. Overnight dills have their fermentation stopped after a few days by being put into cold storage, or by sealing jars immediately.

Sour pickles are made from cucumbers that have been cured in brine and later packed in vinegar liquor flavored with pickling spices. Whole, sliced, or in mixes with brine-cured vegetables, the varieties of sour pickles are almost as numerous as the pickle makers.

Sweet pickles, the third basic type, are sometimes sour pickles from which the vinegar has been drained. Then they are finished in sweet, spicy liquor, the strength of the syrup being gradually increased. For finest flavor they are aged. Home-made sweet pickles are generally of the fourth type, quick or overnight.

Quick pickles include dill, sweet or sour flavors, and undergo no long brine-curing or fermentation. Easy to do, they're popular for home pickling, and when rightly made are delicious and keep well. Commercial quick pickles are often called "Quickles"

Since home pickling need not be tedious, most farm wives like to put up their

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ALA. Mix-in cotton plants. Renovate pastures or clear land, prepare seedbeds for new grass.	**ARIZ.** Prepare high moisture retaining tillage for irrigated crops . . . mix-in cotton plants.	**ARK.** Chop, mix-in cotton plants. Tillage for general seedbeds at less cost.	**CAL.** Clear land, prepare pasture seed beds. Prepare raised beds for vegetables.	**COLO.** Clear land of sage-brush and prepare low cost seed beds.	**CONN.** Prepare low cost, better seed beds for grass, tobacco and general crops.
DEL. Better, lower cost tillage, for truck crops and general farming.	**FLA.** Land clearing (Palmetto) and pasture preparation. Ideal seed beds for truck crops.	**GA.** Finer tillage for tobacco. Mixing-in old cotton plants.	**ID.** Better pasture preparation. Low cost tillage for higher yield potato crops.	**ILL.** Mix-in standing corn. Prepare lower cost tillage for pastures.	**IND.** Better seed beds for grassland for cattle, poultry. Low cost, high germinating all-crop seed beds.
IA. Mix-in standing corn. Prepare low cost pasture and all-crop seed beds faster.	**KAN.** High production, low cost seed beds for wheat and pasture.	**KY.** Labor saving, highly pulverized seed beds for tobacco. Low cost pasture preparation.	**LA.** Faster, lower cost tillage for rice. Mixing-in old cotton plants. Better pasture seed-beds.	**ME.** Low cost, poultry grass ranges. Better tillage, higher yields for potatoes. Faster land clearing.	**MD.** Soil-improving, low cost tillage for all crops. Finer grassland for cattle, chickens.
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MO. Cost-cutting tillage for all crops. Better, lower cost tillage for new grass and pasture renovation.	**MONT.** Fast, economical sage-brush clearance. Tillage for high yield, disease resistant wheat.			**NEB.** High production seed bed preparation for wheat and grass. Mixing in cover crops faster, better.	**NEV.** Pasture tillage for hay crops and grasslands.
N. HAMP. Economical, soil-building tillage for all crops, even under rocky, hilly conditions.	**N. J.** Finer truck crops through better, low cost tillage. Better stands of grass.			**N. MEX.** Higher moisture holding tillage for irrigated land. Mixing-in cotton plants.	**N. Y.** Finer seed beds for richer grassland. Lower cost, better tillage for all crops.
N. C. High pulverization for tobacco land preparation with far less labor.	**N. DAK.** Superior seed bed preparation for flax, wheat and grass.	**OHIO** More productive seed beds for all crops in all soils. More profitable grassland preparation and renovation.	**OKLA.** Mixing-in old cotton stands. Better seed beds for wheat. Faster land clearing.	**ORE.** Labor and equipment-saving tillage for pasture preparation and all farm crops.	**PENN.** Better grass for poultry runs and cattle pastures. Economical tillage for all farm crops.
R. I. Richer, finer grasslands through better seed beds. Higher yields in truck crops and tobacco.	**S. C.** Mixing-in old cotton stands. Soil fitting costs for tobacco sharply cut.	**S. DAK.** Wheat and pasture seed bed preparation generally in one trip.	**TENN.** Mixing-in old cotton stands. Richer pastures from better soil-fitting.	**TEX.** Faster, lower cost mixing-in old cotton stands. Quick, thorough clearance of brushland.	**UTAH** Fast, thorough clearance of sage-brush. Richer, hardier grass from moisture-holding tillage.
VER. Better all-crop yields and finer pastures through low cost, soil-improving tillage.	**VA.** Sharply cut labor costs for tobacco tillage. Higher yields. Superior pastures.	**WASH.** Great economy in nursery soil-fitting. Better seed beds for wheat.	**W. VA.** Tillage in hilly land more economically handled. Richer pasturage at low cost.	**WIS.** Low cost land clearing. Faster, better tillage in all soils for all crops.	**WYO.** High production, low cost clearance of sagebrush. Moisture-holding general tillage.

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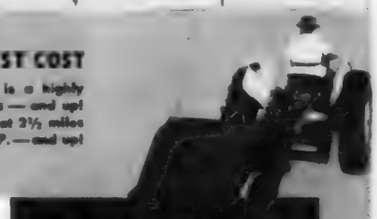

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own pickles. Mrs. Nichols' four New England recipes, followed with exactness, will yield prize pickles of fine flavor and crispness.

Quick Dill Pickles. Wash small cucumbers and pack in quart jars. Place two stalks of dill with flowers in each jar, one at the bottom and one on top.

Bring to a boil:

1 quart vinegar
2 quarts water
1 cup salt

While boiling hard fill jar to overflowing and seal.

Olive Oil Sour Pickles (*Brine cured*). Slice together:

100 small cucumbers
25 tiny onions

Cover with salt and let stand three hours, then drain.

Put down in a large crock with:

1 cup olive oil
4 tablespoons celery seed
4 quarts cold vinegar
2 cups mustard seed, white or black.

Ready after a week, but improve with aging.

Quick Sweet Pickles. 7 pounds of cucumbers. These should be yellow-ripe and cut in sticks.

Simmer in salted water 5 minutes and drain.

Make syrup of:

3 pounds sugar
1 pint vinegar
4 sticks cinnamon
6 whole cloves

Put cucumbers in syrup and boil just until tender, but firm. Fill jars with the cucumber sticks, cover with the syrup and seal.

"For pickling whole," advises Mrs. Nichols," I use the White-spine, Straight or Chinese (China Long) cucumbers when small. They sell well at our roadside stand, for slicing, and are good producers. I use any of the three for the sweet pickle sticks, when yellow-ripe."

Mrs. Les Dietz, of Big Bone, Kenucky, has a prized recipe for *French Pickles.* It comes from an old cookbook of her Great-Grandmother Morissey, and the recipe is credited to "Mrs. President R. D. Hayes, Washington, D. C.':

1 peck green tomatoes sliced
6 Large onions sliced

Mix, cover with cup of salt and let stand overnight. Next day drain, and then boil for twenty minutes in one quart vinegar with two quarts water. Drain. Then boil another fifteen minutes in syrup made of:

4 quarts vinegar
2 pounds brown sugar
½ pound white mustard seed
2 tablespoons ground all-spice
2 tablespoons ground cinnamon
2 tablespoons ground cloves
2 tablespoons ground mustard
2 tablespoons ginger

Pack hot into jars, cover with syrup and put plate over crock. These are sweet-sours and the longer aged the finer the flavor, though they can be used in a week's time.

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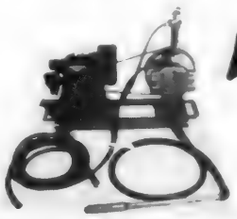

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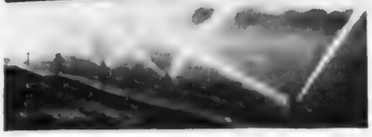

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Nearly 1500 steers got GRANULATED EAR CORN. RESULTS WERE CAREFULLY OBSERVED. HUNDREDS OF GRANULATORS WERE PLACED WITH COOPERATIVE CUSTOMERS TESTS WERE MADE UNDER EVERY CONDITION.

Materials come from this mill in a uniform granulated state, free of flour or dust. Cattle lick bunks clean. Low speed slashes power and maintenance.

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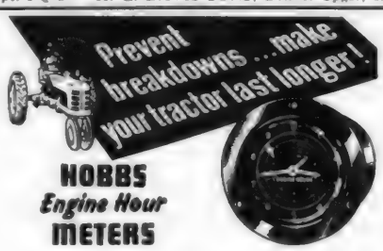

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AMERICAN ANGUS ASSOCIATION
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FARMING IN RUSSIA

(*Continued from page* 39)

fore and showed many bare spots, and one marshy hectare that had not been tiled but was sown anyway.

The kolkhoz is not entirely new. It resembles the commune, or *mir,* that we had in Russia a hundred years ago. As long ago as that, the muzjik was used to collective farming but he still had his garden plot, or *sodok*. This bit of land he always regarded as his very own: and today, the kolkhoz peasant feels the same way about it. His *sodok* is his first love. For the kolkhoz acreages itself he has little affection.

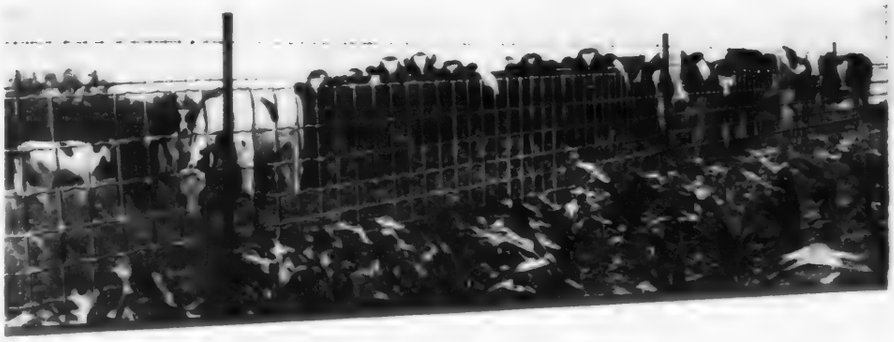
At autumn time, he sees large harvests shipped away from his kolkhoz. This brings him little gladness for his share of the harvest is so small. He does not drive a herd of cattle to market and keep the payment: he drives a grain train to closest city and from the entire harvest he receives, he feels, far too few rubles.

This is his first complaint: he raises much and gets so little. He does not credit the brigadier or the Predsediatel for the management they give.

Each collective farm has its own quota. The quota is set by the district officials before the crop is planted. If there is a dry season and the quota is barely met, the State gets its quota first, then what is left is divided among the farmers on the basis of their workday credits. The Party officials from the *raion* look at a field and say "The biological yield of this field is so much." That means that the field is capable of producing that much if everything is just right and the grain is gleaned off the ground. The actual yield and the biological yield can be very far apart.

Because the quotas are always being increased to meet a new Five Year Plan, every person is asked to work harder, to plow more acres, seed more land, put in longer hours. When the farmer does work harder, and the weather is good, he does receive more for what he raises; also decorations and vacations on the Black Sea. But it is only the big strong men who can make many workday credits in one day. These men are called "shock workers," or "Stakhanovites": the name is from the famous coal miner who made 16 workday credits in one day. Everywhere workers on farms and in factories are encouraged to follow Stakhanov and pile up several norms in one day. Those who excel, perhaps one or two in each collective of several hundred workers, are decorated with medals and get vacations on the Black Sea. But few can hope to do this, although they envy the Stakhanovites. These lucky people eat well and live well but they wear out fast.

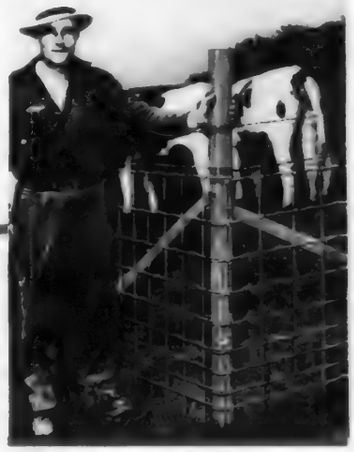
But even the Stakhanovite doesn't get



"Fence plays an important part in good pasture management,"

says DONALD WILLETTE, Delevan, Minn.,

"and I figure I'm way ahead with tight-holding American Fence"



• Since Donald Willette of Delevan, Minnesota, raises cattle and hogs as well as farm crops, good fence is a *must* on his 320-acre farm. He depends on American Fence to do the job . . . well. No cows in farmer Willette's corn!

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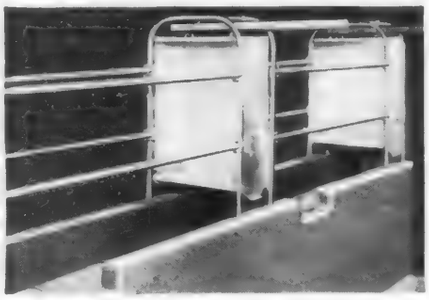

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his share until all the quotas on his collective farm are met. When the crop is in, there first comes the State to claim rental for the land. This takes 20 per cent of the crop. Then the Machine Tractor Station must be paid for the use of its machinery. That takes another 20 per cent. Then there is a reserve for seed and buildings and breeding animals and improvements and the hospital fund and bonds and "donations" to worthy State causes. That takes another 25 per cent. The farmers who did the work are left with one-third of what they raised, which they receive in rubles, after the crop is sold to the State. This may be $400 a year for an entire household.

The Russian farmer does not like to feed and clothe numbers of people who, he believes, are doing less than he is doing. These people are the officials at the collective center, the experts on soils and the agronomists, the accountants and bookkeepers, and crop counters and crop watchers. He knows that for every 100 workers, 15 people are in the official headquarters, and another 10 are guards and watchers and storekeepers. They receive workday credits, too, from the crop he raises.

The older people, who remember the days before all land was claimed by the State, do not like to have their children taken from their homes and taught that the State comes before family, even before God. The father in the home where I lived faced the Ikon each morning and after each meal, saying a prayer and thanking God for blessings. His son faced the same Ikon, but he did not pray. He damned God because he had been taught in the school that there is no God. His curse was: "I ——— the Big God and the 364 little gods for each day of the year." I was upset every time I heard this, for my mother was religious and I had been brought up to fear God.

Winter came early that first year I was at Voronye. Then, there was little work for us. The plowing stopped, for the snow was deep and the ground frozen hard. I cleaned the stable and slept a good deal. Almost every night there was a gathering of some kind.

The muzjik loves to go, after supper, to the home of a friend and there is much talk and dancing and drinking. There was always an harmonika player for the songs, and always someone came up with a jug of home-made *kvas*. The fire burns hot in the big stove, the air grows thick, the boots thump the floor, the lice become lively, too, and all scratch and laugh and sing. These parties in the homes are for the older people. The young men and women go to the Red Club.

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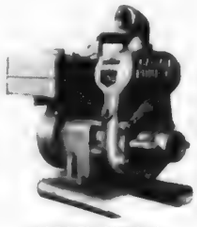

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There was always something going on at the Club. A lecture, a movie, dancing or classes for the Komsomols, those young men and women who are ambitious to become Party members; and some times there would be an amateur play. I went to the Red Club, for I was young and although I had only one eye and was not handsome, the girls made much over me. Men of any kind were scarce. The separated married women and young widows and the young girls went to the Club just to be with a man.

Every week, even during the bitter cold, everyone in the family of Akim Akimovich used the bath house in the yard. It was made of logs with sod between them and a straw roof. Inside, you stepped first into a long narrow hall that kept out the cold. Then, into a second room to undress. This led into a third small room with a brick oven stove as high as a man. Broad wooden steps were alongside the stove. When the oven was flaming hot you threw water on it, which burst into steam and quickly the whole room was a comfortable, hot mist. I climbed on the highest wooden stair, for there it was warmest, and you could regulate the temperature you wanted by the stair on which you stood. We switched ourselves with birch twigs. After doing this, I would run naked into the snow and feel the bite of the cold and then back into the wonderful steam of the bath house. Afterward, we drank *kvas* made from dry rye bread, water and *kvas* yeast, left to ferment for four or five days in a covered crock.

That spring, after the fields were broken and fitted, the crops were put in. The smaller fields were spaded up by hand, for during the war years we were unable to get a tractor from the Machine Tractor Station and our horses were too few to do all the work of plowing. Cows dragged spiked harrows over the field to make a seed bed. The grain was sown by hand: this was what the muzjik knew how to do best. It is the way grain had always been sown and it was almost a ceremony. Some of the old men wanted to have a priest bless the fields before planting, but they were overruled. The agronomist at the collective, Vladimir Orlov, said it was superstition and not scientific.

Akim's son was one of three herdsmen in charge of about 40 sheep. We had been lucky to get a good ram and had 60 lambs. The herdsmen worked in 8-hour shifts, for it was necessary at all times to have a watch on the sheep. Even so, two of the lambs were stolen and Akim, who was on duty at the time, was penalized 10 work days. Our household was sad. We thought the lambs were taken by raiders from a neighboring kolkhoz. The farmer does not

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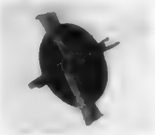
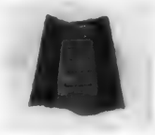


NEW TYPE FEEDER of slat conveyor design, provides a desirable undercutting action to the conveyor that evens out overloadings, reduces strain on the chains and minimizes the amount of material carry-back.



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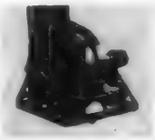

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steal from his own flocks, for a friend of the herdsman may report him. But if he thinks he can take a lamb or a pig from another, he may take the risk.

One morning the Predsedíatel spoke to us and said:

"We are the ones who feed the soldiers and the workers in the factories and mines. The first food we raise is for them, just as the cannons they make or the shots they fire are for us. After we meet the quota assigned to us, then what remains we may have for ourselves or sell to the State as we wish. If we fail to meet our quota there will be nothing left for us, just as if the brave Red soldier's rifle fails to fire as he charges the enemy, then he dies himself. Our quotas at Voronye have been increased 10%."

The Predsedíatel was grave and solemn, for the Party Secretary from the *raion* stood beside him. The Secretary asked: "Are there any criticisms or suggestions?"

We knew then that the meeting was over.

My brigade leader welcomed ideas to produce more, to reduce waste, to stop thieving. Any other criticisms meant the speaker was an enemy of the people who doubted the wisdom of the Party and who wished purposefully to counter its efforts.

The law said that the head of the kolkhoz as well as the farm board is elected by the membership, and the brigade leaders are appointed by the farm board. The law also said any worker was allowed to discuss a grievance freely at membership meetings and the group as a whole would vote to decide the question.

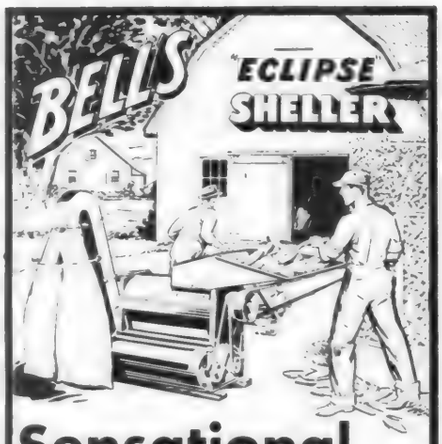
In time this may be so, but during the years of 1943 through 1950 when I worked at the kolkhoz, the membership voted for a one-party ticket which was arranged by the Secretary of the Party of the *raion* where Voronye was located.

If a worker complained openly and found fault with a Party directive, his brigade leader told him to be quiet and to work. If he complained again, the assistant brigade leader, or the accountant, would speak to him and tell him to work well, to remember that in the end the People have it better and better.

If the worker persisted in his complaint, the security police took him to their building for a trial and what happened there was not known, for when he was taken away he never returned.

My brigade leader told me the justice of this.

"Here," he said, "we are partners, and we all work for each other. The harder we work, the more we produce. The more we produce, the more we share. To criticize the wisdom of the Party is to oppose us all."



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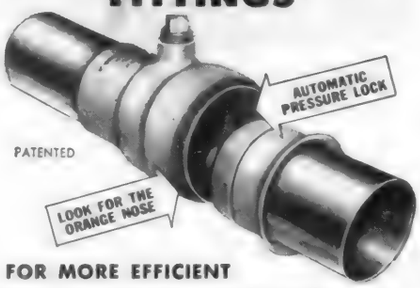

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When harvest came, all other work ceased and the women, with their children, went to the fields as gleaners, so that no grain would be lost. This work paid one-half workday credit. All the wheat ripened at the same time and if it were not cut there would be shattering and much would be lost on the ground. The Machine Tractor Station came with a combine one morning and worked all that day and through the night. That ended our quota of combine time and it moved on elsewhere. We were left with one field to be cut by hand. They said it was because we had not tiled the marshy parts.

The men and women used the sickles and cradles and the children and old people gathered the grain and bundled it. The bundles were tied with straw. Making these ties is an art. You took a good-sized handful of straw, holding it near the heads of the wheat. Then, with a double twist it was tied into a self-binding knot and wrapped around the bundle and the ends tucked in to secure it.

Everyone was in the field at sun-up and worked through the day, until darkness. Meals were carried out in cans or pots and eaten under the shade of a tree at the edge of the field. As a special harvest-time treat, we had bacon grease with salt on bread. When the food carriers appeared at the edge of the field, we all stopped work and gathered around, piling up bundles of wheat to sit on. Sometimes there were traveling harvest singers and dancers.

The chairman of the collective remained in the fields during the harvest and watched that no grain was stolen. Toward the end of the day, the women filled their stockings on the sly and the men their boots. The children had a pocketful in their blouses.

When the grain was threshed, the sacks were tallied by the chairman and locked in the storehouse. The French-made grain separator was a source of wonderment to everybody. Machinery was not a common thing for us and the brigade leader was constantly nagging us to keep away from the tractor and thresher. We would stand watching the wheels and pulleys, neglecting work.

When the wheat was in the storehouse, the Predsediatel made plans for a wagon train to take our harvest to the central storehouses in the city, forty miles away. It was a great adventure to go to Kirov with the grain. For many, it was the only trip to the outside world during the year.

The grain was loaded in the morning, the sacks arranged to make a snug nest for the driver and his passengers. In the late afternoon, after the horses had been fed and the chairman had again checked the number of bags on each wagon, the long train of twenty wagons, some of them pulled by borrowed horses, started for Kirov. On top of each wagon were the driver and as many of his family or friends as could crowd aboard. The men wore their sheepskin jackets, buckled tight around the waist, and newly-greased boots.

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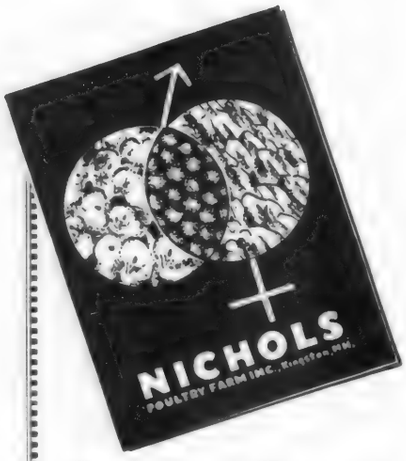

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The women had taken their best dresses from the chest and the young girls had bathed and their cheeks were as red as roses.

The wagon train moved out at a call from the Predsediatel, the drivers shouting to the horses and the wagons creaking and groaning.

There was much calling from wagon to wagon. The old people popped sunflower seeds into their mouths and dozed. The sun went down, and the moon pushed up behind the fir trees on the eastern horizon. The evening star, very bright, was beside the moon.

As the moon rose higher into the dark heavens, those on the wagons became silent. We could hear only the rattle of the harness chains, the heavy breathing of the horses, and the creaks of the axles.

Then, from far to the rear, came the sweet strains of a harmonika playing softly an old tune. A voice joined, then another, and soon all were singing, "Rest is sweet after toil is o'er, is o'er."

Midnight passed. The children, one by one, went to sleep, rocked by the swaying wagons. The drivers dozed and the horses slowed and then a team stopped. Those behind stopped, for their drivers were asleep, too, and the train came to a halt. After a while, those in front, seeing they were alone, cried out, "We have lost our tail!"

When the chill dawn came, the children awakened and were hungry. Bread was broken and passed around, the drivers eating with one hand, holding the reins with the other.

At mid-morning the domes and chimneys of Kirov came into sight, and near the edge of the city, the rutted road joined the military highway. The train soon pulled among the great storehouses and the women and children scrambled down. They were stiff and chilled, but they were happy, for a great day was before them.

Almost everybody had something to sell: the women, a square of bacon, a fowl, or a piece of embroidery for a blouse collar. The men, a small bag of wheat, carried beneath their jackets, or a bottle of *samogon* made from potatoes. I went straight to the State store, for I had been given a shoe coupon, and the shoes I had on were falling apart. At the State store there was one kind of shoes, not beautiful, but solid and serviceable, and made all of leather. I paid 36 rubles for them, almost all my summer savings. They would have cost me 400 rubles in the black market without a coupon. I wore them for a long time.

When the news came that the war had ended, posters went up saying volunteers were wanted to work in the Ukraine. Many farm buildings in this rich part of

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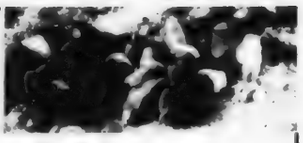

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Russia had been destroyed and a work army was needed. I volunteered because it would bring me closer to Kiev and I could ask if my mother had returned.

The night before several other volunteers and myself were to leave Voronye, our friends made a big party for us. We met in the home of the Brigadier Karekovich. There were jugs of vodka, a keg of pickled cucumbers, herring, and the rare loaves of white bread. All the girls were there in their brightest kerchiefs and we danced until light.

A week's travel got us to the Ukraine. In the freight cars were double rows of wide shelves where we slept or rested. We took all our food with us, for it is difficult to buy food when traveling.

The Ukraine is my mother's country, a fine country with rich, black soil and winters mild and kind. The Ukrainians are fierce, proud people, with a great love for their country, which they believe to be the best in all Russia.

I was sent to a Machine Tractor Station, which was much to my liking, for I had a curiosity about machinery. I was set to work as a helper. I scraped rust, brought tools, and cleaned and oiled machinery.

The first week, there was a call for volunteers to work on Sunday, repairing a power station which had not been too badly damaged by the Germans. After two months, this small station was put in operation with a great ceremony. Two high officials from Moscow were the guests of honor and one of them threw the master switch which caused many colored lights at the Machine Tractor Station to come on at one time. An official said that by 1952, one-third of our collectives would be electrified.

Not long after, two bright red electric tractors were given a trial in the fields. They had great power. A long cable, which wound and unwound from a drum on the tractor, extended to the power line at the edge of the field. They were a great occasion to look at, but would only go as far as this cable would unreel.

Each autumn our MTS made a contract with the nearby collectives for the work to be done in breaking the ground, planting, cultivating and harvesting. The contract specified the depth of plowing, the number of cultivations, and the acres to be fitted and harvested. The operator of a machine turned in a daily report of his work with the number of acres plowed, or the number of bushels harvested. In this way, the MTS watched over the collectives, preventing altering of yields and acres planted. A member of the Party was chairman of the MTS. He was from the north of Russia and the Ukrainian work-

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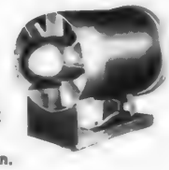

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ers regarded him as a foreigner. One day he called in the security police and a workman who had frequently addressed him as "comrade" but with a sneer, was taken away. Like all others, he was gone for good.

It was easier to earn Work Day Credits at the MTS than on the collective farm because more jobs were paid by piece work.

The MTS served eight collectives in the district, one state farm and a kolkhoz run by Yugoslavia workers. The State farms, called sovkhoz, are different from the collectives. They are owned and operated directly by the State and the workers are paid in salaries, like factory workers. Their pay did not depend on the crop yields: they were paid for time put in.

Most sovkhoz were large, ten, fifteen or twenty kilometers long and that many deep. In 1917, the year of the Revolution, the Central Committee decreed:

> **All private ownership of land, minerals, waters, forests, and natural resources within our boundaries is abolished forever. Henceforth all the land is handed over without compensation to the toiling masses for their use.**

As a result, many large monasteries, great estates, as well as beer, sugar or alcohol factories were taken over in one mouthful with all their lands and buildings. It is these holdings which are now sovkhoz and specialize in sugar, alcohol, livestock, milk or cheese. A few small ones are close to cities and raise vegetables.

Our office staff at the MTS was quartered in the same headquarters building as the security police. The police and the Party members drank and talked together and were a class apart in privileges.

One day I carted machinery to Rudnik Rahonovich, a kolkhoz where the workers were mostly all Yugoslavian women. All of them, it was said, had German fathers or grandfathers. When we liberated Yugoslavia, these women were taken to our Ukraine to farm. When I saw how they lived, I was glad not to be an enemy of the State. Some of them were bold and talked to me. They asked for bread.

One of them said, "We cannot earn enough to eat. If we weep, we are locked in a room by the cattle shed and made to stand 24 hours naked, on concrete, in manure water up to our ankles."

The houses in this kolkhoz had been burned by the Germans and the women slept in holes in the ground. Some had a blanket pitched over the top to make a roof. There was no place to take a bath and the women smelled. The heads of all of them were shaved. A German girl, who looked like she once was pretty, told me her story.

"My mother was from Germany, but lived in Yugoslavia. I was taken away in

the night and they would not let me take my little girl with me. I went to the mines. If we did not dig our 'norm' of ore at the end of the day, we had to stay down all night. But there was a bath at the mine and often we had meat. When I got malaria, they sent me here."

One night at the Red Club we heard a lecture about the new amalgamated kolkhoz. These would be, according to the lecturer, country factories where the workers would live in big villages and go out to the fields like factory workers. There would be all conveniences of running water, lights and town things. These new amalgamated kolkhoz would make farming like a factory. After the lecture there was a good deal of talk about what would happen to the thousands of small villages throughout Russia. We were told that these would be abandoned, as Old Voronye had been, and homes built in amalgamated kolkhoz where there would be fine club rooms, schools, hospitals and theatres.

Although school is free for the first seven grades, not all the kolkhoz have schools, but these amalgamated kolkhoz would have the first seven grades and a high school.

A Ukrainian who had been captured by the Germans and met English and Americans shook his head at this new Plan.

He said: "The State thinks the muzjik puts too much time on his own *sodok*. So, now they will take it away from him."

"But in the end," I said, "will this not raise more food?"

"In the end, who knows? The true reason for these amalgamated kolkhoz is to get the muzjik out of his village and away from his *sodok* and into a big new village where he will have no land of his own and all his work will be for the collective."

I repeated this on to my friends, or those I thought to be my friends, and the next day the chairman of the MTS asked me if it was true that I was an enemy of the Party. My remarks, he said, were made to four people and proved me a counter-revolutionist. I was sick with terror and stood dumb. He told me to stay at home until he came there.

That night, Boris Baidenov, assistant accountant of our MTS, who had helped me by continuing to send letters to Moscow asking about my mother, asked me if I would come into his office. He said the security police were going to question me and that he felt it might go badly. He, too, was terrified, for he had committed a crime himself, and his punishment was now being discussed. To help our MTS workers, he conceived the idea of making wood shingles from unused beams and tools we had, and then trading these shingles to a nearby kolkhoz. In ex-

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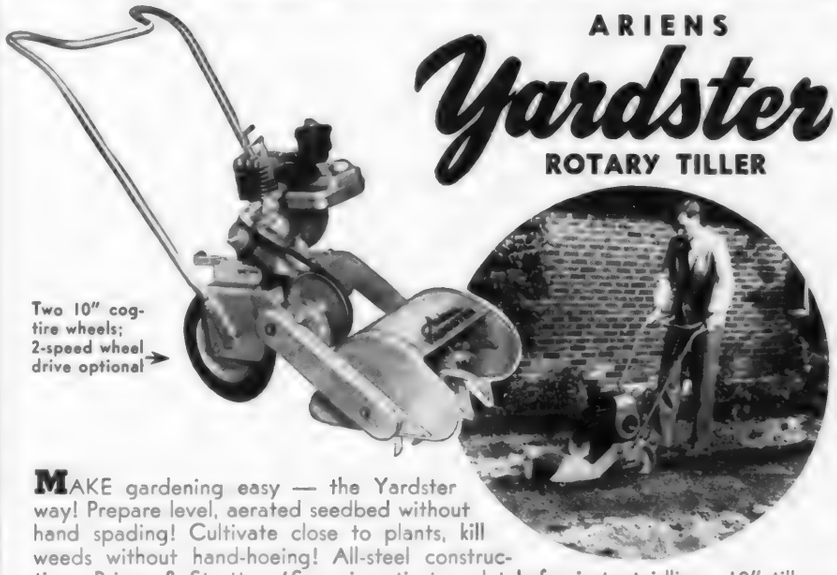

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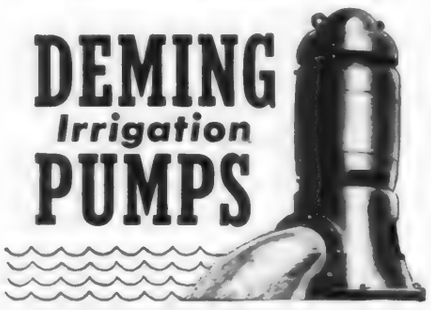

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change he took grain, and this grain he traded to another kolkhoz for fruit. This fruit we had bought with our rubles at the MTS store and the assistant accountant was popular for what he had done.

The Predsediatel was in on it, but had signed nothing himself. The Party Secretary of the oblast which supervised many *raions*, said this trading was against the Party Directive.

"The job of the MTS workers," wrote the Party Secretary of our oblast, "is to follow orders and not go off on their own. To improve the conditions of a few, perhaps at the expense of the many, is to be an enemy of the people."

The assistant accountant feared he might go to prison for five, perhaps ten years. He was going to run away and leave the Soviet Union. Did I want to go with him? I thought of the Yugoslavia women at the Rudnik Rahonovich and grew frightened. I recalled men who disappeared never to be heard of again.

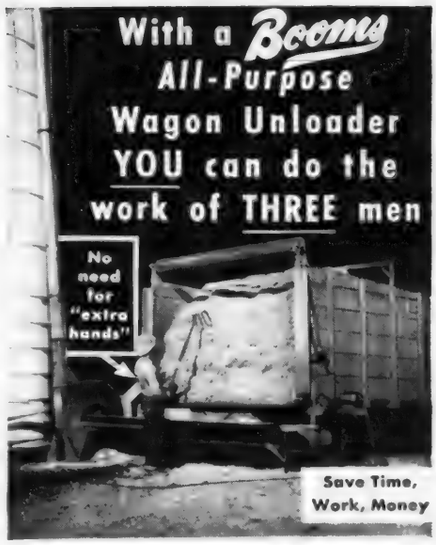
Boris had traveled considerably in the Red Army and said we should go to Kiev and from there to Odessa and then make our way across the Black Sea to Turkey. My heart raced, for in Kiev I could ask about my mother. Boris knew where all the certificates, stamps and official printed forms were kept and he forged passes. Quickly that night, we left.

The train we climbed on was shunted around Kiev. As I lay on top of the train and saw that the road we were taking was going away, perhaps forever, from my mother, I started to cry. Boris, who was lying flat on the car top beside me, put his arm around me. Above the rattle of the train he said: "Who knows where your mother is? She loves you and you love her. They can't take that away. No one can."

We were four months traveling and reached Crete by fishing boat, where we asked for political asylum. I am "outside" for three years and have been asked many questions.

I know little about the cities or the factories or the mines, but I have seen, in seven years, that Soviet farms have more machinery, the transport is repaired. Save 1946, the dry year, production increased on the kolkhoz where I worked. On at least 10% of the 97,000 amalgamated kolkhoz in the Soviet Union, life is good for a third or even half the workers compared to anything they had before. On all the kolkhoz, the leaders have it well. Not so, the others.

In the Soviet today are 200,000,000 people and one out of five, or 40,000,000, work on collective farms. The total crops they raise do not quite feed the country and leave little to export. One of the



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Aerovent Fan Co. 88
Agricultural Labs 86
Allied Mills, Inc. 9
Allis Chalmers Co. 27
Alprodco 128
Aluminum Co. of America (Irrigation) 111
Aluminum Co. of America (Roofing) 83
American Aberdeen Angus 124
American Agricultural Chemical 13
American Berkshire Ass'n 94
American Brahman Breeders 90
American Corriedale Ass'n 114
American Crop Drying 131
American Guernsey Cattle 105
American Hampshire Sheep Ass'n 122
American Milking Shorthorn Society 86
American Shorthorn Breeders 112
American Society of Farm Managers 84
Ames, W. R., Co. 102
Anchor Serum Co. of Indiana 120
Anchor Serum of Missouri 28
Ariens Company 133
Arnold Dryer Co. 93
Aro Equipment Company 18

Babson Bros. Co. 4
C. O. Bartlett & Snow 127
John Bean Mfg. Co. 121
Behlen Mfg. Co. 119
C. S. Bell Co. 128
Belsaw Machine Co. 118
Beltraction Co. 84
Berry Ajax Bros. 132
John Blue Company 124
Booms Silo Co. 134
Bostrom-Brady Mfg. Co. 126
Bower Mfg. Co. 126
Boyt Harness Co. 67
Bridgeport Implement Works 118
Brillion Iron Works, Inc. 94
Burlingame, Field, Pierce & Brown 120
Butler Mfg. Co. 16, 17

Campbell Hausfeld Co. 94
Carver Pump Co. 126
J. I. Case Co. 96, 97
Century Eng. Corp. 116
Champion Corp. 124
Choremaster 136
Clayton & Lambert 24, 81
Cobey Wagon 115
Corn States Hybrid Service 102
Craine, Inc. 88
Cultiller Co. 94

Danuser Machine Co. 84, 102
H. C. Davis & Sons 124
Deere & Co. 29
Delco Division G. M. C. 102
Deming Co. 134
Doane Agricultural Service, Inc. 91
Douglas Fir Plywood Assoc. 120
Dow Chemical Co. 70
DuBois Fence 93
Dunham Company 117
Duplex Mill & Mfg. Co. 116

Early & Daniel Co. 136
Eaton Mfg. Co. (Eaton Axle) 20
Edwards Laboratory 95
Elec. Auto-Lite (Spark Plugs) 92
Elec. Auto-Lite (Batteries) 23
Ezee Flow Corp. 129

Fairbanks Morse & Co. 84
The Farm Clinic 136
Farmers Book Club 130
Farmland Irrigation Co., Inc. 89
Farm Tools, Inc. 109
Harry Ferguson Co., Inc. 11
Ferndale Farms 130
Ford Truck Division 2
Fox River Tractor Co. 101

Gardner Mfg. Co. 80
Gehl Bros. Mfg. Co. 132
The B. F. Goodrich Co. 6
A. D. Goodwin & Son 134
The Goodyear Tire & Rubber Co., Inc. 2nd Cover
Gorman-Rupp Co. 107, 110
Gravely Motor Plow 127
Grazing Fields 91
Great Lakes Steel Corp. 26

Hardie Mfg. Co. 107
Hartzell Propeller Fan Co. 82
Heil Mfg. Co. 93
Hercules Steel Products Corp. 103
Dr. Hess & Clark, Inc. 116
John W. Hobbs Corp. 124
Hoffco, Inc. 98
Hoover Soil Service 136
Hotchkiss Steel Products 110
Hubbard Farms, Inc. 115

International Harvester Co. 1
International Salt Co. 86
Irrigation Equipment Co. 109

Jacobsen Mfg. Co. 69
Jacuzzi Pump Co. 120
Jari Products 130

Katolight Co. 122
Forrest Keeling Nursery 88
Kenru Farm 120
King-Wyse, Inc. 114

L. M. L. Eng. & Mfg. Corp. 112
Life Insurance Co. of North America 134
Louden Machinery Co. 126

Magnolia Farms 68
Marietta Concrete Co. 126
Marlow Pumps 91
Martin Steel Corp. 3rd Cover
Massey Harris Co. 19
McDowell Mfg. Co. 128
Merchants Creamery 124
The Meyer Mfg. Co. 126
Milwaukee Equip. Mfg. Co. 88
Minneapolis Moline Co. Back Cov.
Majonnier Bros. Co. 114
Morton Salt Co. 135
Moulton Irrigation Co. 136
Muellers Supplies 128
Sam Mulkey Co. 110
Musser Forrest, Inc. 120
F. E. Myers & Bro. Co. 103

National Agricultural Supply Co. 116
National Band & Tag Co. 122
National Business and Property Exchange 128
National Cooperatives, Inc. 106
National Farm Equipment & Supply Co. 91
National Rainbird Sales & Eng. Corp. 82
National Turkey Institute 110
New Holland Machine Co. 85
New Idea Div. AVCO Mfg. Corp. 3
Niagara Chemical Division 90
Nichols Poultry Farm, Inc. 130
Nutritional Research Assoc., Inc., 130

D. W. Onan & Sons, Inc. 122
Opekasit, Inc. 112
Ortho Pharmaceutical Corp. 110
Oshkosh Filter & Softener Co., Inc. 114

Papec Machine Co. 104
Peirson-Moore Co., Inc. 117
Perfect Circle Corp. 10
Portland Cement Assoc. 87
Potash Rock Co. of America 22
Proto Tool Co. 80

Ralston Purina Co. 113
Rebo Mfg. Co., Inc. 86
Red Poll Cattle Club of America 130
Rilco Laminated Products Co. 67
Rinehart & Co. 110
Roof Welding Works 116
Roto-Hoe & Sprayer Co. 100
Rototiller, Inc. 21

Safgard Div. 126
St. Paul Hydraulic Hoist Div. Garwood Industries 95
Scott's Farm Seed Co. 118
Jos. E. Seagram & Sons, Inc. 7
Seaman Motors, Inc. 123
Security Mfg. Co. 90
Shox-Stok, Inc. 88
Shur-Rane Irrigation Corp. 119
Skinner Irrigation Co. 67
Smith Agricultural Chemical Co. 105
E. R. Squibb & Sons 8
Stark Bros. Nurseries 25
Stone Mountain Grit Co. 14
The Stoody Co. 128
Sudbury Laboratories 15

Tennessee Corp. 122
Tiger Tractor 130
Tokheim Oil Tank & Pump Co. 121
Towner Mfg. Co. 83

U. S. American Fence 125
U. S. Industrial Chemical, Inc. 108
U. S. Steel Co. (Roofing) 99
United Steel Fabricators 100

Vickers, Inc. 12
Jos. A. Vogel Co. 114

R. M. Wade & Co. 133
Whitmire Research Lab. 114
Willoughbys, Inc. 118
Wisconsin Motor Corp. 131
Woodbine Farms 114
Wood Products Co. 112
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Feed Cost High?

Here's how Morton Trace Mineralized Salt helps animals make better use of feed

WITH the high cost of feed and labor cutting into livestock profits, good feed conversion is more important today than ever before. Livestock must be thriftier, gain more on less feed, make better use of purchased supplements.

A mineral feeding plan, built around Morton's Trace Mineralized Salt is one of the surest ways to accomplish this . . . and widen the gap between high feed costs and skidding market prices.

Morton's Free Choice Trace Mineralized Salt supplies the sodium and chlorine of salt which are so vitally important in the digestion and assimilation of proteins and carbohydrates. In addition, Morton's T. M. Salt supplies the trace minerals—iron, copper, cobalt, manganese, iodine and zinc. These trace minerals influence and control the enzyme, vitamin and hormone functions—those basic life activities that convert the grains, grasses and forages into nutrients and then, in turn, build these nutrients into bone, meat, milk, and wool.

The result is that with Morton Free Choice Trace Mineralized Salt there is better use of feed by your livestock . . . more efficient feed conversion . . . faster gains, better health — *and lower feed costs.*

It costs only a few cents more per animal per year to get the extra benefits of Morton Trace Mineralized Salt. Your dealer has Morton T. M. Salt in stock. Ask for it by name — feed it free choice to all your livestock.

Fed MORTON TRACE MINERALIZED SALT livestock are healthier, thriftier. Their frames are bigger to carry more muscle tissue.

With Morton's Trace Mineralized Salt, animals gain weight faster, with less time between weaning and market. They grade higher . . . are more profitable.

By controlling vitamin, enzyme and hormone functions, the trace minerals help livestock to get more value from proteins, grasses and forage.

The trace minerals are vital to reproduction . . . to preventing breeding failure. Young are more vigorous, healthier. Mother animals produce more milk.

MORTON *Free Choice*

TRACE MINERALIZED SALT

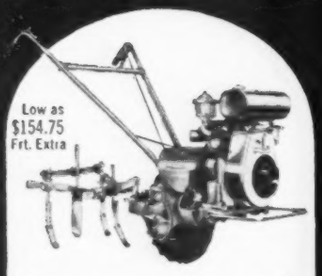
for Healthier, Thriftier Livestock

FREE . . . This 32-page booklet gives you complete facts on feeding salt and trace minerals to all classes of animals. Mailed Free and postpaid. Morton Salt Co., P. O. Box 781, Chicago 90, Illinois.

CHOREMASTER

. . . the finest

ONE-WHEEL GARDEN TRACTOR



Anyone can use this compact 1½-3 H. P. tractor . . . takes work out of lawn and garden chores. Don't buy costly single-purpose units . . . CHOREMASTER quickly becomes a power mower, cultivator, snowplow or sickle bar. Just add low-cost attachments as needed. Write for dealer name and literature.

Send 10c for handy DIAL-A-GARDEN GUIDE. Tells you when and what to plant, insecticides and other gardening helps.

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with TWO irrigations using...

MOULTON PORTABLE IRRIGATION System

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MOULTON QUICK COUPLER
no bolts or rivets . . . a completely welded unit.

"I purchased 80 rods of Moulton Irrigation equipment including a 600 gallon per minute centrifugal pump. I was so well pleased with the results obtained that we have reordered 120 rods of pipe to irrigate about 200 acres this year. We irrigated 30 acres of corn with the following results:

Not irrigated . . . 37 bushels per acre
One irrigation . . . 67 bushels per acre
Two irrigations . . . 124 bushels per acre"

LET OUR MANY YEARS' EXPERIENCE HELP YOU PLAN YOUR EXACT IRRIGATION REQUIREMENTS.
WRITE TODAY FOR DETAILS

MOULTON IRRIGATION COMPANY
POST OFFICE BOX 553 WITHROW, MINNESOTA

reasons for this is that 25% of the collective farm workers are supervisors, accountants, bookkeepers, crop watchers, crop counters, etc., because the muzjik cheats whenever he can.

In America, I am told, you have 160,000,000 population and 8,000,000 are farmers. The farmers raise enough to make a large food surplus, and America is a big exporter of food. To me, this means collective farming is not the best way to raise the most food.

The people I meet ask me if the muzjik will revolt. He does not think along these lines. He wants mostly to control his own acre of land and farm it for himself; he wants more rubles for his work on the kolkhoz. He is afraid to be completely at the mercy of the Predsediatel. The security police frighten him to the marrow of his bones but there is nothing he can do about it. In the Communist Party are 6,000,000 members and 1,000,000 candidate members. These are the believers and the bosses and they live well. If 100 people can be made to produce more, at the price of a great personal injustice to one man, then the great personal injustice will be done.

Between the kolkhoz leaders and the security police, who watch both them and the workers, is no affection. Our MTS Chairman was ambitious and bold; most of the leaders were conscientious and afraid. The workers were mostly indifferent to the success or failure of the crops except on their *sodok*.

In Russia, the big leaders in Moscow control the Army and the Security Police. Revolution would quickly come in Russia if these top leaders broke with each other and divided the loyalty of the Army and the Security Police; but Revolution from the bottom cannot come when the police control is tight.

In translating this manuscript the spelling was followed literally. Other more preferred versions are: *"Chairman"* of the kolkhoz—*"Predsedyatel"*; *"garden plot"*—*"sadok"*; *"peasant"*—*"muzhik"* or *"mujik"*; *"The Crows"*—*"Vorony."*—Ed.

FARM CONSULTATION AND PLANNING

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This New MOLASSES MIX for dairy and beef cattle is easy to handle

TUX-Sweet Rolls—the new Tuxedo molasses mix—are soft-centered molasses pellets, specially treated to avoid stickiness. They do not set up; are free flowing; grind easily. TUX-Sweet Rolls contain 45% molasses, 11% protein, valuable vitamins and minerals. Molasses promotes the activity of the bacteria in the animal's rumen, which in turn means better digestion of roughage. With TUX-Sweet Rolls added to roughage, grains or supplements, your beef or dairy herds will eat more, digest more roughage, drink more water—you'll bank more money. See your Tuxedo Dealer.

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CINCINNATI, OHIO

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TUX-Sweet Rolls

45% Molasses

IS COLLOIDAL PHOSPHATE SUPERIOR TO CHEMICALS?

IN A CAREFUL GROWING TEST, John Bunting, Danforth, Ill., found that Colloidal Phosphate produced an **11% bigger yield of corn at 35% lower cost** than his favorite chemical fertilizer! This is a typical experience of farmers the country over, for Colloidal Phosphate brings better results in practically any soil or climate. **Action is immediate,** for minerals are in the digestible form plants require . . . ready to enter directly into cellular structures and produce stronger, faster plant growth. **A real soil builder!**

ADD MARLAND (greensand marl, rich in potassium and many trace elements) for even better growing results. It loosens and opens hard soils, binds sandy soils, regulates moisture and stimulates soil organisms.

FREE BOOKLET describes Hoover Soil Conditioners . . . including Soil-Nu, the amazing product with volcanic ash base. Write today. **Dealer inquiries also invited.**

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Gilman, Illinois

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SELF FEEDING HAY

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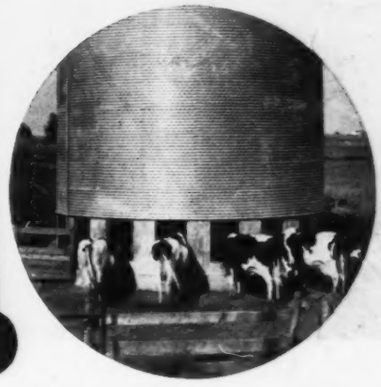

and provide a year-'round "Green-Pasture" feeding program

Your feed costs drop . . . your milk and beef profits go UP when you plan a year-'round "Spring Pasture" grass feeding program with a Martin Haymaker and Silo. Scientifically engineered to provide feed equal to fresh green pasture all year, Martin Haymakers and Silos have earned the enthusiastic approval of America's leading beef and dairy herd owners. Plan now to learn more about these TWO modern ways to cut your feed costs.

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Why all 4 HARVESTORS give up to 2¼ hrs. more harvesting time . . . Every Day!

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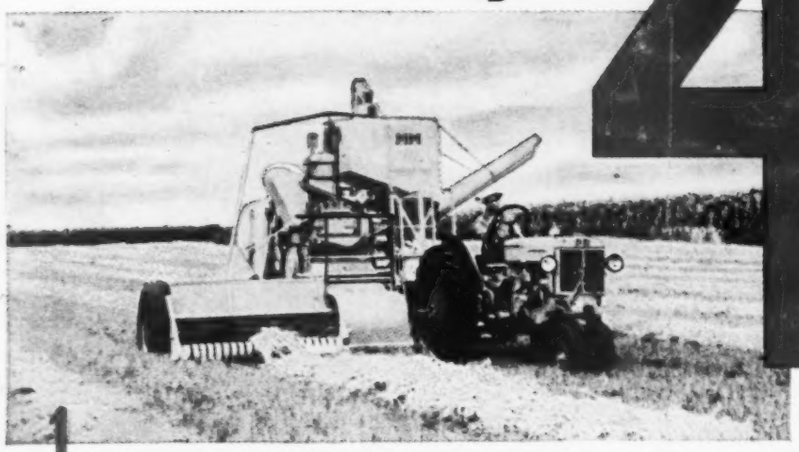
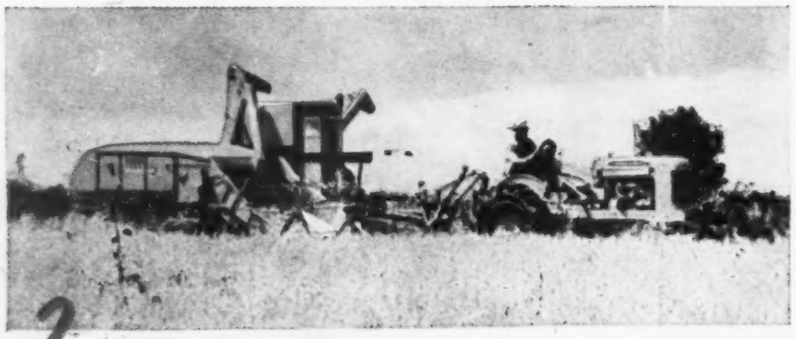
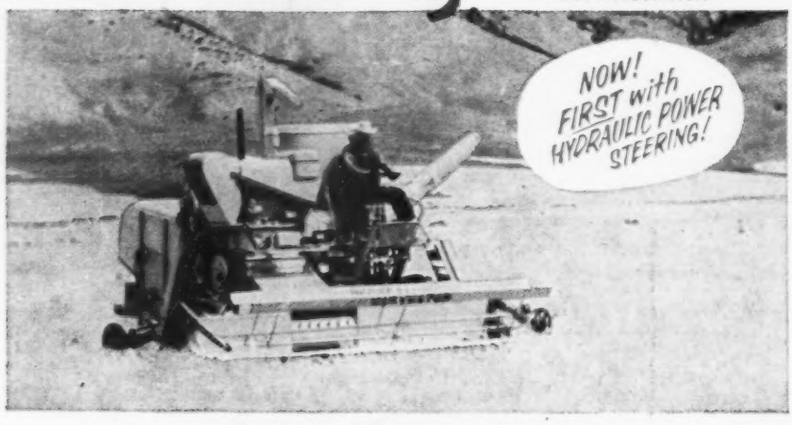


1. **BIG CAPACITY** and lightweight design make this MM G-4 Harvestor the biggest-selling combine in its size. Easily handled by the 2-3 plow MM Z Tractor, the G-4 offers balanced construction, one or two-man operation.

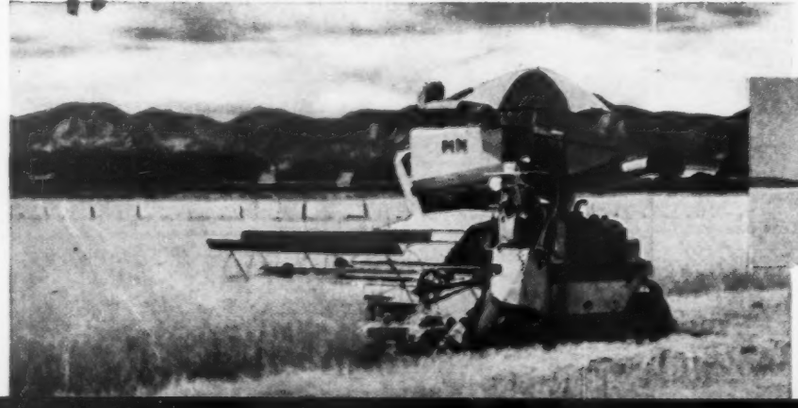


2. **ONE MAN BECOMES** a whole harvesting crew with this MM "69" Harvestor and 2-plow BF Tractor. As on all 4 MM Harvestors, exclusive, straight-through combining and one-piece concave and grate offer extra capacity, cleaner grain.

3. **HERE'S THE MIGHTY "S"** . . . Self-propelled Harvestor with hydraulic Power-Flow drive. Many new design advantages plus recognized performance put the "S" in a class by itself for low-cost harvesting, bigger-profit operation . . . 12-, 13-, and 14-foot sizes.



4. **MAKING NEWS, AROUND THE WORLD,** that's the new MM Uni-Harvestor. Shown here with Harvestor attachment, the Uni-Tractor also handles the 2-row Uni-Huskor and Uni-Picker-Sheller attachments. New attachments on the way. See your MM dealer for additional facts!



See why ALL 4 MM Harvestors put you MONEY AHEAD!

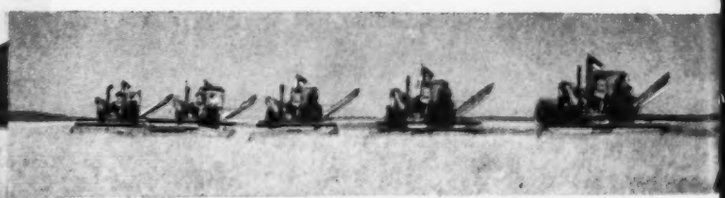
Today, when every machine on your farm has to show a surer profit than ever before, it's *twice* as important that you get the facts on the money-making HARVESTORS. Whether your farm calls for the MM Harvestor 69, the 12-foot G-4, the self-propelled S Harvestor, or the pace-setting new MM Uni-Harvestor . . . MM gives you a combine that's built to pay you *bigger profits*, to cut your costs by cutting your time in the field.

THIS IS HOW MM HARVESTORS GIVE YOU *MORE* HARVESTING TIME

MM builds the Harvestors knowing that *minutes* mean *dollars* during harvesting season. That's why equipment like the MM auger unloader is standard on the Harvestors unless otherwise specified. With the MM auger you can save up to 2¼ hours of valuable time *every day*. Here's how! Combining 15 acres of 60-bushel grain in one day the auger unloader handles 900 bushels of grain. With the 20-bushel grain bin of the MM Harvestor "69", for example, you would unload 45 times. The fast auger unloader empties the bin in approximately 90 seconds. Compared to other combines that do not have the MM auger, the "69" saves about three minutes per unloading, or 2 hours and 15 minutes. And that's not all, MM Harvestors can be unloaded standing still or *on the go*. You do not have to stop to empty the bin . . . but you still get the same *faster* operation of the MM auger unloader.

SEE YOUR MM DEALER FOR HARVESTOR FACTS!

If you want the *bigger capacity* operation and the *extra* harvesting time that MM Harvestors offer—see your MM dealer. He can give you real *facts* on all 4 Harvestor models . . . facts that show *profits* in *your* farming operation.



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